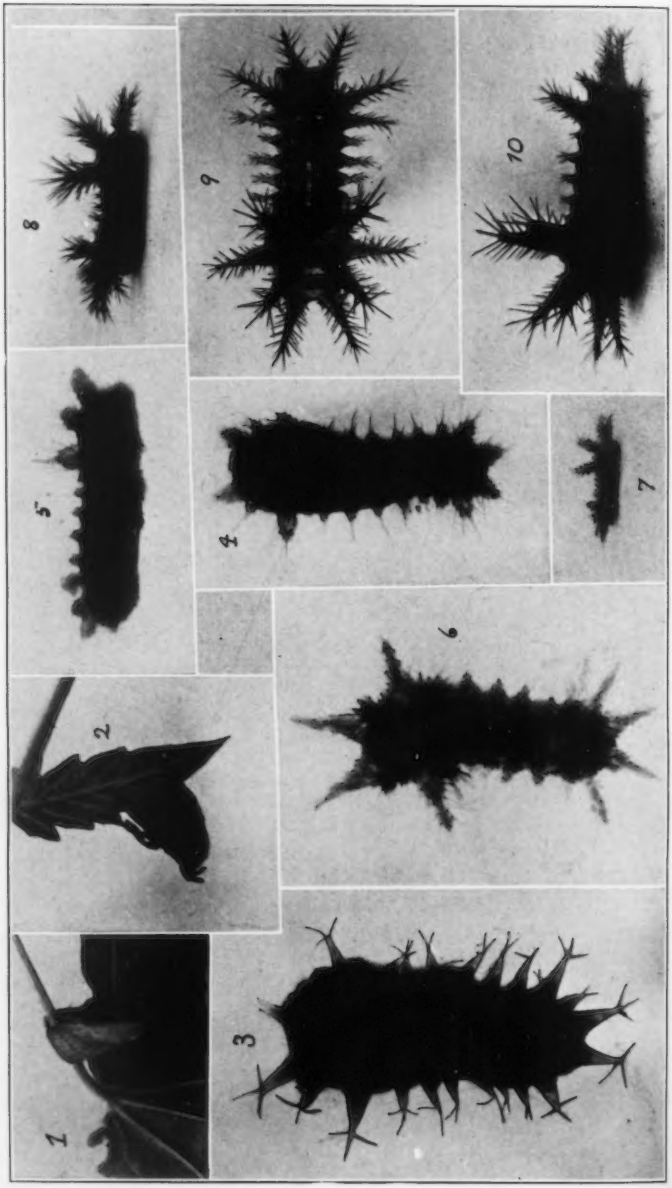
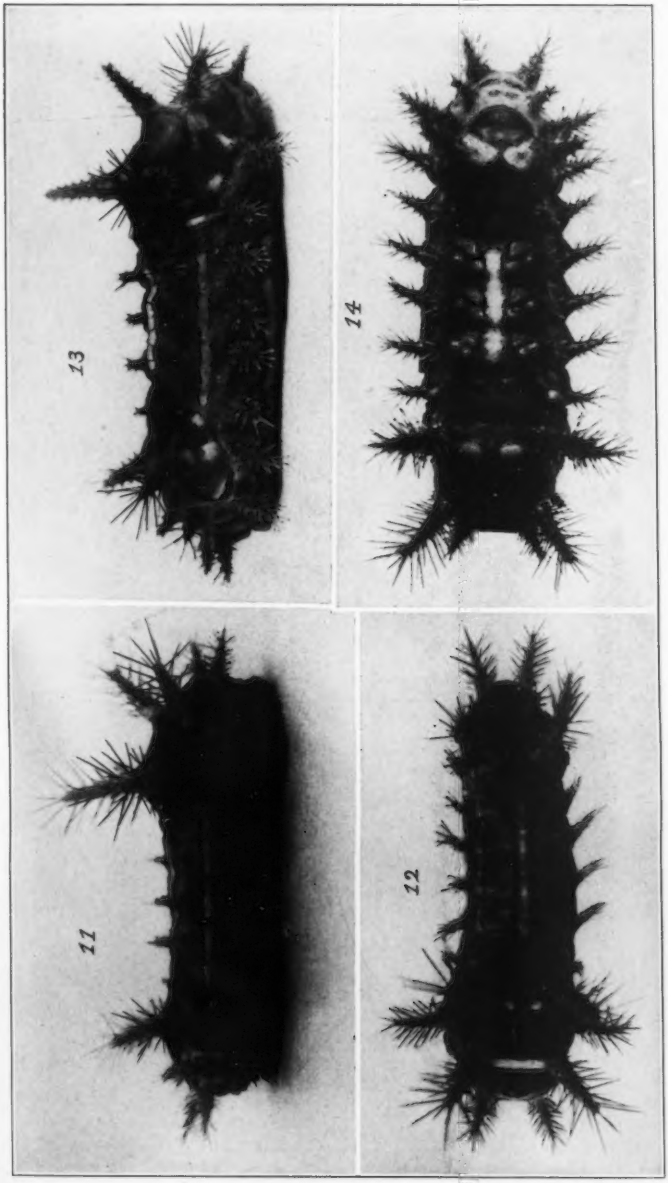


THE ORIENTAL MOTH (FERNALD).



THE ORIENTAL MOTH (FERNALD).

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The Early Stages of the Oriental Moth.

BY H. T. FERNALD AND J. N. SUMMERS, Amherst, Mass.

(Plates X, XI.)

The early stages of the Oriental Moth, *Cnidocampa flavescens* (Walk.), have never been described and several attempts to obtain fertile eggs from the moths in captivity have failed. This has been supposed to be because the small space provided by a breeding cage either prevented mating, or because the confinement in some way affected the moths. To avoid such difficulties a large number of the cocoons of this insect obtained at Dorchester last spring were placed in a greenhouse in which several Norway Maples were growing, all openings having been screened with cheese cloth.

The moths began to emerge June 22nd, probably rather earlier than would usually be the case in the field and certainly two weeks earlier than in Dorchester this year, the season being very late, and the first eggs were observed June 26th. The moths by this time had become very abundant in the house and eggs by the hundred were obtainable by the first of July.

During the day time the moths remain quiet, assuming a most grotesque position. Grasping some object, preferably the edge or petiole of a leaf, with their middle or hind feet they let themselves hang downward till the outer margins of the closed wings come against some object in which position they remain. At night they remain quiet till well after darkness before flying, not being crepuscular. Their flight is quite speedy and produced by very rapid movements of the wings and they are somewhat attracted by light. Their average life seems to be about a week or ten days.

The Egg.—The eggs are deposited on the underside of the leaf, mainly near the margin and preferably toward the apex. They are oval in outline, though sometimes a little irregular, lenticular, one of the surfaces being in contact with the leaf. They are about 1½ to 2 mm. in length by ¾ to 1 mm. in width, transparent, though sometimes showing a faint milky white color. Examination under the microscope shows that the chorion is finely sculptured, irregular polygonal areas being present, the longest diameters of the polygons being more or less at right angles to the long axis of the egg. Scattered over the surface are tiny elevations or papillae averaging about four to each polygon, though many lie on the lines between the polygons. No micropyle was observed.

Fig. 1.—Portion of chorion—from camera drawing.

In the later stages the embryo becomes plainly evident and finally escapes through an opening in the side of the chorion after an embryonic life of six or seven days.

First Larval Instar.—The newly-hatched larva measures about 1 mm. at rest and in motion elongates about 1/5 mm., the head being retracted into the second (prothoracic) segment when the larva is quiet. The head and second segment are much narrower than the rest of the body. The body increases in lateral diameter to the middle of the fifth segment, then tapers gradually to the end, which is rounded. Its vertical diameter is also greatest at the fifth segment. Annulations are very indistinct. The color is white and semi-transparent, except for a pale straw tinge, which is seemingly internal in location. A row of sub-dorsal horns and a row of lateral horns is present on each side, the sub-dorsal horns being located, one on each segment from the third to the thirteenth inclusive, while the lateral horns are on the third, fourth and sixth to twelfth segments inclusive. The first three sub-dorsal horns are in length nearly half the diameter of the body, and their

basal diameter about one-third their length. The fourth is rather smaller while the next four are still smaller and shorter. The last three, however, are much larger and increase in size, the last one being fully as large as the first one of the row. Each horn bears two or three black spines on its tip, the larger ones bearing three, and the smaller ones two, usually each spine being nearly as long as the horn on which it is borne. The horns are white with transparent areas. The first two lateral horns are about equal to the sub-dorsal horns of the same segments, in size and appearance, but the next six are rather smaller. The last lateral, however, is large and like the sub-dorsal of that segment. The larger of these horns bear three black terminal spines, while the smaller ones seem in some cases to bear but two, though the exact number could not always be determined. The color of the lateral horns is like that of the sub-dorsal ones. An evident depression along the mid-dorsal line is present. Color beneath like that above. Legs not distinguishable. Duration of instar, about three days.

Blackish streaks appear in the horns at the base of the spines toward the end of the instar—possibly the spines of the following instar.

Second Larval Instar.—Length 1 4/5 to 2 mm. at rest; about 2 2/5 mm. when in motion. Annulations of the body more pronounced. General color yellowish white, but there is a dark spot on each side of the head, the mouth parts are dark and the clypeal region is brownish.

Mandibles brown on edges, four-toothed. Maxillae showing two teeth or lobes. Viewed from beneath a cresentic lobe lies just above the mouth, bearing a number of hairs.

Antennae of three segments and a terminal bristle. The first three sub-dorsal horns are very large and stout, and bear many spines with black tips. The fourth is very small and bears two small spines. The fifth, sixth, seventh and eighth are larger, about equal in size, and each bears five or six spines. The ninth and tenth are much larger, equaling the second and third, and with many spines on the outer fourth. The eleventh is like the first, these two being the largest and having scattered spines to their bases. The first lateral horn is of medium size, rather blunt, but little longer than its basal diameter and bearing several terminal spines and a ring (?) of them a little lower. Second lateral very large—as large as the first sub-dorsal—about twice as long as its basal dimeter, and with numerous spines on its tip and sides. The third to eighth lateral horns, inclusive, are about the size of the first, short, stout, with a long spine or two at the tip and a few shorter ones on the sides near the tip. The ninth lateral is about like the eleventh sub-dorsal, but perhaps more slender. The lateral horns of the middle of the body are larger and stouter than the sub-dorsal horns of that region. Skin glistening, and with minute punctures. Heart beating plainly seen, and also dark-colored food in the alimentary canal. Legs very small, but actively used; of the usual structure.

Anal region noticeably punctured and with a few very small hairs between the anus and the lower margin of the eleventh sub-dorsal horns. A few scattered simple spines are present on the sides below the lateral horns. Duration of instar, four to five days.

Third Larval Instar.—Length, at rest, 3½ to 4 mm.; in motion, about ½ mm. greater. Head and body much as in the previous instar. Color deeper yellow. First sub-dorsal horn about 4/5 mm. long, nearly twice as long as the second and third. Fourth to eighth inclusive very short; ninth and tenth longer; eleventh nearly as long as the first. First lateral, short; second, about like the first sub-dorsal, third to seventh inclusive, very short; eighth longer; ninth nearly as long as the last sub-dorsal. The spines near the bases of the horns are shorter than those nearer the tips. Duration of instar 4½ to 5½ days.

Fourth Larval Instar.—Length at rest about 6 mm.; in motion, about 7¼ mm. Annulations of the body are now well pronounced. Sides of head darker than hitherto, with a median lighter area. General color greenish yellow. Along the mid-dorsal line is a white band extending from the sixth to tenth segments inclusive, external to which is a green stripe reaching from the fourth to the tenth segments. Between the bases of the sub-dorsal horns is an opaque yellow band, and between these and the lateral horns is a white longitudinal stripe.

The horns themselves appear to differ little from their condition in the preceding instar.

Duration of instar, 5 to 6 days.

Fifth Larval Instar.—Length at rest, about 9 mm.; in motion, about 10¼ mm. As in all the preceding instars the color is at first nearly uniform, with only faint traces of the markings which later become more prominent, the spines becoming much darker. General color of the larva when it has become pronounced, pale yellow. The stripes become like those of the last stage, except that the green band is hardly perceptible and the yellow between the sub-dorsal horns is darker. In this instar the fourth sub-dorsal horn is much reduced; the fifth, sixth and seventh are small, but increase in size posteriorly; the eighth is smaller than the seventh, the ninth is three-quarters the size of the first, the tenth much shorter, and the eleventh equal to the first. The first, second, third and ninth grow darker toward their tips. Relative length of the lateral horns as before. Spines somewhat darker after the color has fully developed, than in the previous instar, each now showing two parts plainly; a longer, stout part, and a slender outer end which easily breaks off and causes an irritation worse than that from *Automeris io,* if it touches the skin. These tips vary in length, some being quite long, others short. Duration of instar, 5 to 6 days.

Sixth Larval Instar.—Length at rest, about 12½ mm.; in motion, about 13¾ mm. General color, pale yellow, but with its colored areas much more pronounced than heretofore. Head quite strongly bilobed,

black, mottled with lighter. Antennae darker than before. Second segment with its surface granulated. Cervical shield dark brown, mottled with lighter. A large, dull red area covers the dorsal surface of the third segment behind its spines and the fourth and fifth segments, and extends backward as a wedge-shaped elongation on the mid-dorsal line on to the seventh segment. At the sides this area does not quite reach the lateral horns, and a band between and around the second sub-dorsal horns is yellow, as is also a pair of spots between the third sub-dorsal horns. At the side of the area a triangular blue spot is wedged into the area on a line between the second sub-dorsal and second lateral horns like a similar spot lateral to the third sub-dorsal horn, while a third blue spot, rather oval in outline, rests against the margin of the red area as it begins to narrow posteriorly, just lateral to and in front of the almost obsolete fourth sub-dorsal horn.

In the seventh segment the end of the red area encloses a blue stripe, lighter in the middle, extending into the tenth segment, where it is enclosed by one corner of a rather triangular dull red area which covers a part of the dorsum of that segment and all of the dorsum of the eleventh nearly as far back as the bases of the ninth sub-dorsal horns, and between which the area is slightly extended backward. Lateral to the tenth sub-dorsal horns which arise from yellow areas, the dull red extends backward somewhat, its outer margin in contact with three dull blue spots. From the hinder end of the lateral extensions a faint reddish band crosses the dorsum, completing the enclosure of the two yellow areas from which the ninth sub-dorsal horns arise. These two areas are separated from each other by a median blue spot on the anterior portion of the eleventh segment, from which a blue line passses backward crossed by the faint reddish band, and, in the area between the ninth and tenth sub-dorsals, forms a large spot tinged slightly with reddish. Extending from the blue spot in front of the fourth sub-dorsal horn to that on the tenth segment is a narrow, creamy white band margined on each side by an incomplete green line. A narrow yellowish band extends from the second lateral horn nearly to the posterior end of the body below the spiracles. Annulations of the body well marked. Duration of instar, 5 or 6 days.

Seventh Larval Instar.—Length at rest, about 20 mm.; in motion, about 22½ mm.; greatest diameter, about 11 mm. Head less bilobed than in the preceding instar. The red areas are darker and their outlines have changed somewhat, the anterior one beginning just behind the first sub-dorsal horns and covering the entire dorsum from one row of lateral horns to the other on the third, fourth and fifth segments, except as noted below; narrowing on the sixth to lie between the sub-dorsal horns of that segment, and narowing to a dorsal band on the seventh and eighth segments. On the hinder part of the ninth segment this band becomes somewhat broader, and on the tenth and eleventh

segments it becomes quite broad, constricting, however, to a narrow band again, between the sub-dorsal horns of the eleventh segment, but then enlarging to form an oval spot. Just behind the sub-dorsal horns of the tenth segment a small lateral extension from this dorsal area connects it with an irregular patch of the same color which lies on the tenth, eleventh and twelfth segments between the sub-dorsal and lateral rows of horns. The median area and the lateral patches are so placed with reference to the sub-dorsal horns of the eleventh segment as to leave these arising from the centre of peninsulas of yellow, the isthmus being on the twelfth segment. The dorsal band is interrupted on the eighth and ninth segments by a blue spot on each segment, and there is a blue spot below the dorsal horn on the margin of the red area on segments four, five, six, ten and eleven, and a faint one on the twelfth segment. Anal shield greenish brown, crossed by two light bands. A similar patch occurs just below and lateral to it on each side, crossed by one band. The two fine green lines between the sub-dorsal and lateral rows of horns, described in the last instar, are present, but the creamy stripe they limit is absent.

There is a narrow yellow band between the two second sub-dorsal horns, which encloses their bases and extends a little lateral to them. At the base of each third sub-dorsal horn toward the mid-dorsal line is a yellow spot. In general the yellow color is deeper close to the margins of the red areas.

Fourth sub-dorsal horn very minute and bearing only one spine. The body, as a whole, is noticeably four-sided.

Duration of instar, 5 or 6 days.

Pupation.—The larva changes color somewhat as pupation approaches, the blue and red becoming duller, and the yellow assuming a reddish tinge. After finding a place at which to pupate the larva bites off any loose bark which may be present, smoothing the surface, then spins a loose network of threads around itself and attached to the bark, within which it forms the cocoon.

The threads of the cocoon are attached to the bark and are woven back and forth, the larva moving its head along the lines of a figure 8 from one side to the other. As the threads come closer, the larva seems to secrete a fluid from its mouth which causes the threads just being spun to adhere to those already in place and continuation of the spinning finally produces a solid covering.

During this time the larva contracts as much as possible, drawing its head back into the second segment and is able to move about quite freely within the cocoon.

The cocoon is very light-colored at first, but gradually darkens, hardening at the same time, and assumes the peculiar markings characteristic of this species. As far as outside appearances go, it is completed in two or three hours, and at this time the outer network is often no-

ticeable over the cocoon, somewhat like the network of ropes outside of a balloon. This network soon disappears, however, probably weathering off.

EXPLANATION OF PLATES.

From Photographs by the Senior Author, all but the First Two Much Enlarged.

Fig. 1.—Oriental moth at rest on petiole of maple leaf.
Fig. 2.—Same at rest on tomato leaf.
Fig. 3.—First instar seen from above. Microphotograph. Spines retouched.
Fig. 4.—Second instar from above. Microphotograph.
Fig. 5.—Same in side view. Microphotograph.
Fig. 6.—Third instar from above. Microphotograph.
Fig. 7.—Same from side.
Fig. 8.—Fourth instar, side view.
Fig. 9.—Same, dorsal view.
Fig. 10.—Fifth instar, side view.
Fig. 11.—Sixth instar, side view.
Fig. 12.—Same, dorsal view.
Fig. 13.—Seventh instar, side view.
Fig. 14.—Same, dorsal view.

Thecla (Incisalia) polios.

By Henry Skinner.

This species was described by Cook and Watson in the *Canadian Entomologist,* Vol. XXXIX, Page 202, 1907. I have known the butterfly for about twelve years and I possess thirty-five specimens from various localities. I do not consider it specifically distinct from *Thecla mossi* Hy. Edws. I have examined the type of *mossi* and through the kindness of Mr. William Beutenmuller possess a fine colored figure of it. I also have homotypes. The species has a wide distribution and is quite variable. In *mossi* there is a white edge to the mesial band on the underside of secondaries, and in some specimens this becomes a hoary band or fascia about 2 mm. wide. The species extends across the continent from the Atlantic to the Pacific. I have specimens from New Jersey, New Hampshire, Nova Scotia, and Colorado. I have seen specimens in the collection of Mr. T. N. Willing, taken at Olds, Alberta, Canada, and the type (♂) come from Esquimalt, Vancouver Island. The species is figured on pl. 38, fig. 331, in Wright's Butterflies of the West Coast.

Preliminary Remarks on the Myrmecophily of the Caterpillars of the Family Lycaenidae.

By H. Viehmeyer, Dresden, Germany.

It is a more or less well-known fact that certain caterpillars of the Lycaenidae have a transverse slit, or aperture on the antepenultimate segment, through which they discharge a juice which is a much coveted and favorite food for ants. In consequence of this the caterpillars are much sought after by the ants on their food-plants and, like the plant-lice (Aphidae), are stroked with the antennae and so incited to discharge the juice. The ants, on their part, are said to afford the caterpillars a certain amount of shelter from many enemies, by giving the full-grown caterpillars the opportunity of pupating (*i. e.* changing into a chrysalis) in their nests. Beyond this slit or aperture on the 11th, these caterpillars have further on the 12th segment two peculiar small tubes or tentacles, which can be stretched out and drawn in, and which bear at the tips fine spicules, or a bristle-like crown. There is nothing known for certain about the use of these; they are supposed to be organs of defense, or means of attraction, perhaps means of defense against too importunate ants. Thomann considers both aperture and tentacles as adaptations to the ants' visits. For the slit or aperture no other evidence is necessary. Whether the extensile organs may be considered as adaptations depends upon whether they only occur in connection with the aperture. According to some literary assertions this does not appear to be the case. We cannot yet say with any certainty how far these assertions are important. The two organs in question are small enough to be partly or wholly overlooked by many observers. The caterpillars I have observed always show both or neither tokens; only with some caterpillars of the genus *Thecla* I was unable to come to a certain decision. The blown-out caterpillars appeared to have an aperture but no tentacles. However, we must wait for the examination of living caterpillars, or of those preserved in spirit. The views of Brant and others on the specification of individual caterpillar groups of this family by slit and tentacles are certainly erroneous.

A survey of the literature shows that these marks occur in the most diverse groups of the Lycaenidae, most frequently in the Lycaena group, but it cannot be said generally that the caterpillars of the Lycaenidae or only the genus *Lycaena* are all myrmecophilous, for even in this genus we find, together with a great number of caterpillars undoubtedly equipped with myrmecophilous adaptation organs, others in which these tokens are wanting. In the literature many opinions are to be found on the matter; in how far they are trustworthy must be left undecided. Confining myself to my own observations, I can cite a caterpillar of the genus *Lycaena*, namely, *Lyc. optilete* Knoch. I made this discovery in the examination of the caterpillar collection of the late Dr. O. Staudinger.* In 13 species of caterpillars of the genus *Lycaena* I could infallibly identify the presence of aperture and tentacles. They can be comparatively easily and well recognized with a weak glass on mature and well blown-out specimens. The slit with its both edges is generally walled or blown up like a cone, and the tentacles are often stretched out, even the bristly crown sometimes is spread out. If the caterpillars are, indeed, not fully blown-out, one must observe them very closely. The tentacles, which are not stretched out, then generally appear like round light spots, appearing behind the last spiracles. The matter is, however, very questionable if the last abdominal segments, as can easily occur, are crushed or withered up. In specimens in alcohol both tokens can also be easily recognized.

Lycaena optilete was, as has been said, the only species in which these tokens failed. It was very difficult for me not to believe in some error or confusion; yet the type of caterpillar, the great number of specimens (15, and all especially well blown-out), the name of the collector, the conscientiousness of the former possessor of the collection, all must finally convince me of a fact which, when rightly considered is not to be wondered at. The plant-lice offer in this respect similar relations. From this—that aperture and tentacles never belong

*Chr. A. Bang-Haas, Blasewitz, Dresden, proprietor of the firm, Dr. O. Staudinger and A. Bang-Haas, was kind enough to allow me to examine this collection, and also to use the copious library, for which I here offer him my warmest thanks.

in general to one genus—then must follow, firstly, that all sorts of caterpillars of the Lycaenid family must be examined, and then that not only the positive condition—the verifying of such organs, but also the negative (non-existence) is very important. The great wealth of species of the family Lycaenidae and the very secluded habits of the caterpillars set very narrow limits to the first examination. In the collection of Dr. Staudinger I have been able to examine 45 Lycaenid caterpillars all belonging to the palaearctic fauna, and I must consider, according to present experience, that I have before me one of the greatest, if not the greatest, caterpillar collection. The much smaller one, which Mr. F. Griebel Speier,* was good enough to send for my inspection, contained also 6 further specimens of the tokenless species. Together, with all the species mentioned in the literature, we know about 85 specimens, a very small number compared with the great wealth of species in the family. We can gather from this how valuable every increase in knowledge is, even though of only one species. Especially with regard to the non-European species, we are entirely dependent on the literature for information; and just in this, it would be most important to receive material for comparison.

We can undoubtedly consider as myrmecophilous the following species: †

Thecla tengstroemi *Ersch.* !
Rapala schistacea *Moore.*
Lycaena admetus *Esp.* !
amanda *Schu.* !
arcas *Roth.* !
argyrognomon *Bergstr.* !
var. aegidion *Meissn.*
argus *L.* (aegon *Schiff.*)
arion *L.*
astrarche *Bergstr.*
caton *Bergstr.* !
cellargus *Rott.* !
Lycaena corydon *Poda.* !
cyllarus *Rott.* !
damon *Schiff.* !
escheri *Hb.* !
eumedon *Esp.* !
hylas *Esp.*
icarus *Rott.* !
jolas *O.* !
melanops *B.* !
melissa *Edw.*
minimum *Fuessl.* !
orion *Pall.* !

* Whom I here thank heartily for his great kindness.

† In the species marked ! I have been able to partly verify, partly re-examine the presence of the aperture or slit and tentacles. The sequence of genera I owe to the kindness of Prof. Courvoisier, Basel. It is founded on his studies of the veins of the wings of this family.

Lycaena scudderi *Edw.*
sebrus *B. !*
Zizera lysimon *Hübn.*
Cyaniris argiolus *L. !*
pseudargiolus *Bd. & Lec.*
Chilades lajus *Cram.*
arochilus *Fr.*
Lycaenesthes emolus *Godt.*
Catochrysops cnejus *Fabr.*
pandava *Horsfs.*
Polyommatus baeticus *L. !*
Azanus ubaldus *Cram.*
Tarucus theophrastus *F.*
Lampides aelianus *F.*
telicanus *Lang.*
Everes comyntas *Godt.*
Aphnaeus vulcanus *Fabr.*
Zalmenus evagoras *Don.*
ictinus *Hewits.*
Ogyris genoveva *Hewits.*
Gerydus symethus *Cram.*

Besides there still exists a small number of caterpillars where the question must remain for the present undecided, because either the possession of the organs in question has not been definitely verified, or opinions in the literature are contradictory. Of the greater part of the caterpillars mentioned here, nothing more, indeed, is known than that they live with the ants in Symbiosis. Which species of ant comes into question is, in the large majority of cases unknown. De Nicéville only can we thank for extensive information on the subject. Every butterfly collector who collects the Lycaenid caterpillars, should therefore not neglect to observe the ants that visit them, to observe the manner of their intercourse with the caterpillars, to preserve a number of ants in spirit, and to publish the well-determined names of both ants and caterpillars. It is by no means sufficient to say: "visited by a little yellow ant," or "in company with the common black ant." Generally it is not necessary to seek far for the ants, for the nest is often to be found under the feeding plant. Also the digging out of such nests often offers a proof of the living together of caterpillars and ants. In a whole series of Argus-caterpillars pupation seems to take place in the nest of their visitors. Perhaps also many species hibernate in the same place. Observations on this point have not yet been published. The question of in how far the shelter ascribed to the ants really exists would be greatly explained by such observations. An especial attention should be devoted to the behavior of the ants towards those butterflies which come out in their nests. No observations exist on the behavior of the species of ants to those caterpillars which they do not normally visit; thus the so-called

"international relations" of the Lycaenid caterpillars should be studied in order to verify beyond doubt if the friendship between the ants and the caterpillars is limited to certain kinds only, or whether, as in the plant- and shield-lice it has a more international character. So far any hint or information is wanting on the phylogeny of the myrmecophilous adaptation organs, as well as an anatomical examination of these, or a chemical examination of the juice which comes from them.

The commencement of a solution to many of these enigmas has been made; unfortunately most of these studies fail for want of the necessary materials. Therefore, I venture to ask the kind help of all those who are able to assist me in the matter. This could be given:

1. By sending me well-determined caterpillars of Lycaenidae (blown-out or in spirit, formol, etc.), particularly non-European specimens.*

2. By sending me ants that have been observed in company with caterpillars or nymphs (chrysalids), or by informing me of the well-determined names.

3. By informing me of other personal observations which have not as yet been published, and which bear upon observations and studies touching this subject.

Dresden A., 16, Reissigerstr. 21 (Germany).

Dr. James Fletcher, Dr. Henry Skinner and Mr. T. N. Willing conducted a series of farmers' meetings in the Province of Saskatchewan, Canada, from July 18th to 31st. The subjects considered were noxious weeds, injurious insects, and insects in relation to the transmission of disease. Five hundred and fifty miles by rail and six hundred miles by wagon were traversed through a most interesting country. Later Drs. Fletcher and Skinner spent a few days in the Rocky Mountains of Canada.

Notes on Jamaican Hemiptera.—"A Report on a Collection of Hemiptera Made on the Island of Jamaica in the Spring of 1906." By E. P. Van Duzee. This is a paper of seventy-nine pages and is No. 5 of Vol. VIII of the Bulletin of the Buffalo Society of Natural Sciences. There are copious notes on the insects collected. One new genus and upwards of fifty new species are described. This cannot help but be a valuable contribution to the literature of the subject.

* Kindly address large packets of caterpillars to Prof. Dr. K. Heller, Dresden A., Zwinger, Royal Zoological Museum. Prof. Heller, custodian of the Museum, has most kindly arranged for the special safety of the caterpillar collections, to receive the same for me in the Museum and to undertake their careful return.

Cook: In Defense of Incisalia henrici.

By HENRY SKINNER.

Mr. J. H. Cook, in the September, 1907, number of the journal of *The New York Entomological Journal*, p. 123, has published an article that is in part unnecessarily abusive, discourteous and untrue. I never take exception to just and proper difference of opinion or criticism, and it is very unpleasant for me to be compelled to answer some of his remarks. I do not intend to refer at this time to any differences of opinion we may have in regard to species of *Thecla*, but I do wish to reply to Mr. Cook's words on page 127 of his article. In ENTOMOLOGICAL NEWS* I said, "Having had occasion to study some Theclas . . . . I came to the conclusion that *Thecla henrici* Grote and Robinson is a pure synonym of *irus* Godart." The following letter from Mr. Cook, dated Albany, February 21, 1907, was received:

"There seems, therefore, to be plenty of recent precedent to justify me in vilifying you to the extent of my vocabulary and in heaping great masses of obloquy upon your offending head for having had the temerity to express an opinion contrary to my own. If, then, you will kindly consider yourself smeared all over with vilification poultices and buried up to your eyes in obloquy I will take for granted the keen satire and uncomplimentary allusions, which should be the answer to such an attack. By so doing we can save valuable time and space and give the superheated atmosphere an opportunity to disappear. Thus we may get down to the facts sooner. And, now, that the preliminary controversy is over, you may be interested to inquire what it was all about. But seriously, Dr. Skinner, I think that you must have overlooked some recent literature on the subject, or you would not have permitted the expression of your very remarkable opinion on the specific validity of *Thecla henrici* to get into print. I enclose the literature†, to which I refer, and shall be very glad to explain any points which have not been made clear in the text."

I replied to this letter and refer to his article in one of my own in ENTOMOLOGICAL NEWS, Vol. XVIII, p. 129. Mr. Cook refers to the life history of *henrici*, as given by Mr. Edwards in the following words: "Edwards, who bred what he thought

* Vol. XVIII, p. 45.
† Can. Ent., Vol. XXXVII, p. 216.

to be *henrici* (Papilio, I., 150-152), etc.," in the separate he sent me, and then in his recent article says: "Dr. Skinner can hardly plead that the facts were unknown to him without laying himself open to the charge of culpable ignorance of the literature of his subject." . . . . This reference is in most of the catalogs, including my own. I later received another letter from Mr. Cook (March 3, 1907), to which I also replied, and my letter had a return address on it, too. I will not quote this in full, as I wish to save space. He practically repeats his argument given in Can. Ent., Vol. XXXVII, p. 216, and in addition says: "The larvæ and eggs are sufficiently unlike to enable the veriest tyro to distinguish between them at a glance." Mr. Cook had not published anything on the larva of *henrici,* and he scores me for suppressing facts communicated in a letter. He knows perfectly well that I replied to his letter, and I also told him I did not consider it proper to take cognizance of anything not in the literature of the subject. I had the temerity and audacity to have an opinion of my own in regard to the matter and have thereby been charged with culpable ignorance, suppression of evidence and discourtesy. Mr. Cook knew perfectly well that I received his letter, and the inference he wishes drawn shows almost malicious deception. His feeling is shown in his first letter, where I permitted the expression of a very remarkable opinion to get into print. Even though I may have been wrong I do not think I owe Mr. Cook any apology for my opinion. If those interested in natural history are compelled to accept the ipse dixit of everyone, or be abused, it is high time different methods are adopted. I can see nothing in his letters that should have prevented the appearance of my article. After considering myself smeared all over with vilification and buried to the eyes in obloquy (in litt.) I did not expect to see it in print also.

PROF. AND MRS. J. H. COMSTOCK have been spending the summer camping in the high Sierras of California.

MORGAN HEBARD and J. A. G. Rehn were collecting in the Southwest and Orthoptera were the insects desired. We will hear later the result of the journey.

An Insect Ventriloquist.

By A. N. CAUDELL, Washington, D. C.

That man is not the only creature possessing ventriloquous ability is a fact admitted by all students of nature. Many birds are known to be excellent ventriloquists, and any person who has collected insects through the notes of their song knows that many of our species are adepts in the art. Belonging to the order Orthoptera are a number of species that, at times at least, are not readily located by means of their stridulation. Usually, however, a circular walk of fifty feet or so in diameter will encompass the songster and quite accurately locate its position. Rarely is a specimen found over a hundred feet or so from its apparent position.

The most extreme case of deceptive location of a singing insect that ever came under my observation, and I have located many a noisy orthopteron by its song, occurred on the evening of August 2d, of last year. Dr. Dyar and I were stopping at Longmire's Springs, at the base of Mt. Rainier, in Washington. About dark, as we were strolling up the road through the forest, we heard an insect stridulating by the roadside. I at once recognized it as an orthopteron, but one whose note was unfamiliar to me. Both Dr. Dyar and I readily located its apparent position in a small bunch of twigs not over eight feet from us. Being very desirous of capturing the insect I cautiously approached, but when I reached the spot where I supposed the creature to be secreted the sound no longer seemed to proceed from that point, but from an old stump a dozen feet further on. This new position was carefully approached, only to find the delusive sound moved to a point a few yards still further on. I now proceeded to persistently follow that spooky note from point to point, sometimes straight ahead and sometimes to one side or the other, till a distance of over two hundred yards was traversed. Dr. Dyar, lacking the enthusiasm of an Orthopterist in a quest of this nature, strolled on, leaving me to pursue my *ignis fatuus alone.* My chase led me over great stones, under fallen logs, across a ravine and up a steep hill. Darkness approached rapidly, the little light

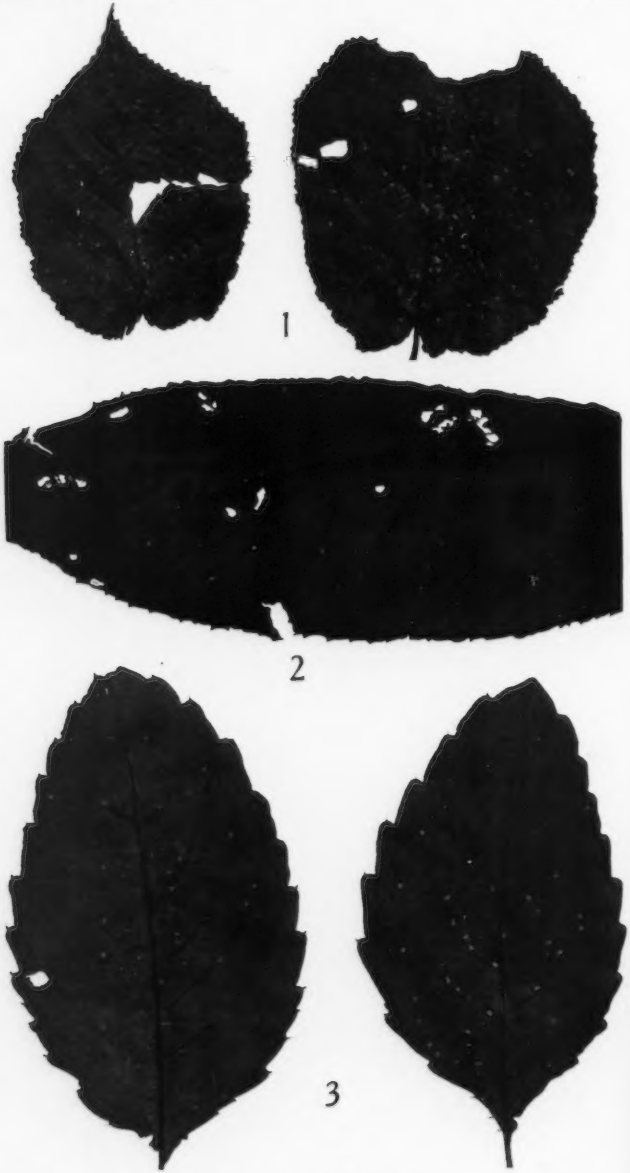
remaining of the fast dying day was lost amid the great evergreen trees about me. The fantom note, ever sounding beyond me, together with my somber surroundings, brought over me a feeling of exaggerated loneliness that made light and human companionship very desirable. I therefore gave over my fruitless chase and hastened back to the road and was soon pouring my tale of woe into the unsympathetic ears of Dr. Dyar.

Other specimens of the insect were heard singing as we returned, and the next evening, armed with a very dirty lantern, kindly loaned us by an accommodating host, we sallied forth to capture one of the songsters. This we succeeded in doing, capturing two males after much climbing over and under fallen timber. The species proved to be, as I had surmised it would, *Cyphoderris piperi,* a species described by me some time before from the same locality. The very large and inflated elytra of this insect seem especially adapted to the production of ventriloquous notes. The effect was probably intensified in the case cited above by local conditions. The difference between the apparent and actual location varies, as that of the two specimens captured was not so much as that observed the preceding evening, being probably something over one hundred yards.

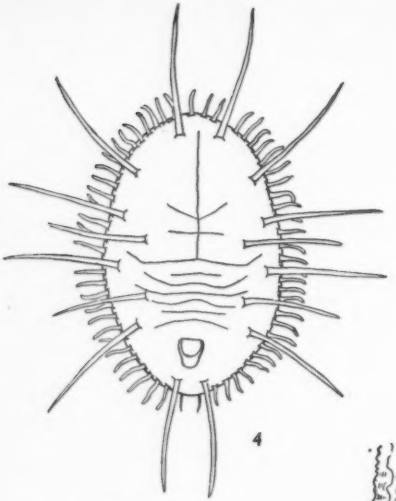
Cyphoderris piperi was described as a variety of *C. monstrosus,* but it is very surely a distinct species and should be so listed. Like *monstrosus,* which has been reported as ventriloquous by Turley, *piperi* is slow of motion, and when disturbed shows little inclination to leap. The specimens taken by Dr. Dyar and myself crawled slowly along the twigs upon which they were resting, keeping on the side opposite the observer. They sometimes stridulate quite persistently, but usually they cease their song when closely approached.

No, Maude, dear, the bee culturist doesn't suffer from hives any more than the lumber dealer does from shingles.

HENRY A. WENZEL and Harry Kaeber had a most successful collecting trip to Miller Canyon, Huachuca Mountains, Arizona. They brought back many rare and interesting Coleoptera.



BRITTON ON ALEYRODIDÆ.



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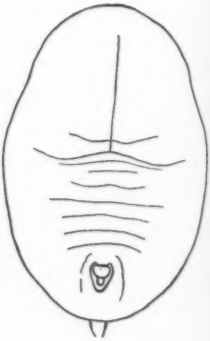

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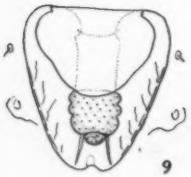

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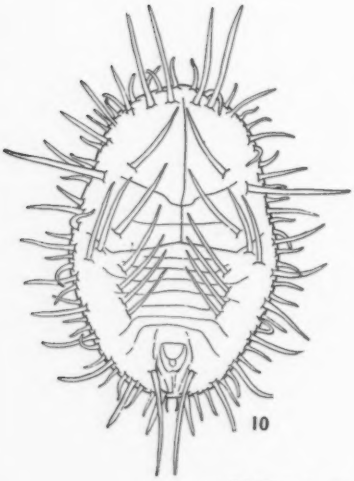

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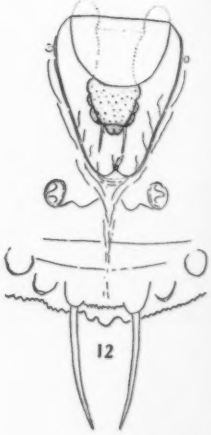

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BRITTON ON ALEYRODIDÆ.

Some New or Little Known Aleyrodidae from Connecticut.—III.*

By W. E. Britton.

(Plates XII, XIII.)

I wish to call attention to an error that has appeared in a previous paper of mine. In writing of *Aleyrodes mori* Quaintance (see Entomological News, Vol. XVII, p. 129), I made the statement that "Morrill described a subspecies *maculata* (Psyche, Vol. X, p. 81, 1903), which differed from *mori* in the adult stage by having a bright yellow body." As a matter of fact *mori* has the bright yellow body, and the body of the subspecies *maculata* is white with black markings.

In corresponding with Dr. Morrill, I am now convinced that the specimens taken in Connecticut represent his subspecies *maculata* instead of the type, which, according to his observations, is much more limited in range than *maculata*.

Aleyrodes coryli sp. nov.

Egg.—Unknown.

Larva.—Oval in shape, rather more than two-thirds as broad as long, and of light yellowish color. Margin and vasiform orifice darker yellow than other portion. Margin bears short, slightly curved glassy wax rods, and a pair of short incurved hairs at caudal extremity. The dorsum bears no wax rods or secretions of any kind.

Pupa Case.—Length from .65 to .74 mm.; greatest breadth .38 to .47 mm. Shape broadly oval, slightly constricted cephalad of the middle, with the posterior slightly more pointed than the anterior extremity. Color of pupa light greenish yellow, empty pupa skins white. Raised from surface of leaf by a vertically striated wall of wax about 134 μ high. Dorsum slightly convex, furrowed transversely according to adult segmentation. Marginal area radially and deeply corrugated or wrinkled. Margin finely crenulate. Six pairs of straight or slightly curved upright wax rods from 200 μ to 230 μ long are borne upon the dorsum a short distance from the margin; one pair each is borne at the cephalic and caudal extremities, the latter pair being closer together than the former; the other four pairs are nearly equidistant from each other, but are slightly nearer the cephalic pair than the caudal pair. The other pairs of slightly shorter rods are situated as follows: One pair on last thoracic segment, just in

* For the preceding papers on this subject, see Ent. News, Vol. XVI, p. 65, March, 1905, and Vol. XVII, p. 127, April, 1906.

front of the transverse splitting line, each rod being about halfway between the margin and the center; the second pair occupy a similar position on the fifth abdominal segment. All of these rods break off readily, and some or all were wanting in nearly every specimen examined, but the pores show their location. There is a marginal fringe of smaller curved wax rods about 90 μ long rising upward and then curving outward. A pair of incurved hairs or setæ about 57 μ long are borne at the caudal extremity.

Vasiform orifice subtriangular, about 60 μ long by about 50 μ broad, with angles rounded and sides bulging. Operculum semicircular, five-sevenths as long as broad, reaching half the length of orifice, base nearly a straight line, apex broadly rounded. Lingula spatulate, irregularly seven-lobed, three lobes on each side, with a pair of spines or setæ about 16 μ long borne at the extremity one on each side of the terminal lobe. Lobes minutely and densely papillose.

Adult.—Female.—Length about 1.15 mm. Wings about 1 mm. long by .38 mm. wide.

Male.—Length about 1 mm. Wings about .92 mm. long and .36 mm. wide. Rostrum about 210 μ long. Hind tibia .31 mm. long. Wings white, immaculate, somewhat iridescent by reflected light, and covered by a mealy or graular secretion of white wax. Hind tibia .37 mm. long. Legs and body yellow. Eyes constricted, but not divided.

Types.—U. S. National Museum.

Cotypes.—Collection of Connecticut Agricultural Experiment Station, New Haven, Conn.

Described from 2 ♀ s, 10 ♂ s, and hundreds of pupa cases.

Habitat.—First found by the writer on leaves of hazel, *Corylus americana* at Poquonock, Windsor, Conn., in July, 1903. On July 18th and on August 12th, 1904, my assistant, Mr. B. H. Walden, collected more material from the same place, and the same species was found by the writer at Westville, August 5th, 1904, and at New Haven, August 14th, and Woodbridge, August 25th, 1906, all on *C. americana.* Mr. Walden collected it at Scotland, Conn., August 1st, 1904, on both *C. americana* and *C. rostrata.*

A few scattered specimens on the common high bush blackberry, *Rubus nigrobaccus,* Bailey, growing near the hazel at Poquonock (Aug. 12, 1904,) appear to be this species.

In some cases the larvæ and pupa cases were abundant, forty or fifty occurring on a single leaf. Many of those at Poquonock had been attacked by a coccinellid larva *Delphastus pu-*

sillus Lec.,* which had eaten holes through the dorsum, usually in the anterior portion, and devoured all but the exterior portion or shell. Material collected at New Haven August 13th was rather highly parasitized by a minute chalcidid of the family *Aphelininae,* kindly determined for me by Dr. L. O. Howard as *Encarsia luteola* How.

Named from the genus of plants upon which it was found.

Aleyrodes waldeni sp. nov.

Egg.—Unknown.

Larva.—Yellowish white in color, oval, about five-eighths as broad as long. Dorsum flat or nearly so, with a row of spines or wax tubes around the margin. No tubes or other wax secretion on dorsal surface.

Pupa.—Length about .57 mm.; breadth about .40 mm. Shape oval, broadly rounded at ends, but more or less constricted and modified locally by the plant hairs surrounding it; well raised from the surface of the leaf by a vertically striated wall of wax about 153 μ high. Color of pupa light greenish yellow, empty pupa skins white, vasiform orifice darker and yellowish. Dorsum rather strongly convex, furrowed transversely according to adult segmentation. Marginal area somewhat wrinkled or corrugated. Margin finely crenulate. Fringed with a submarginal row of down-curved glassy wax rods about 10 μ long. Just inside the margin is a row of stouter, more or less curved, wax rods, mostly standing upright. Other rods are borne upon the dorsum, the longest being as long as half the breadth of the insect, and are arranged as follows: Four at cephalic extremity; two half way the length of the thoracic region, one on each side; one pair just behind the last pair, between the margins and ends of the first transverse furrow; one pair on last thoracic segment; two pairs near the margin at base of the abdominal region; one pair on each of four of the abdominal segments, one rod on each side, and placed near the ends of the furrows of segmentation; two at anal extremity. These rods are very brittle, and are altogether wanting in most of the dried specimens studied; in the mounted material the location of these rods can be made out, yet there seems to be considerable variation in the number and arrangement.

Vasiform orifice subtriangular, with angles rounded and sides bulging; about seven-eighths as broad as long. Operculum nearly semicircular or slightly reniform, two-thirds as long as broad, and reaching half the length of the orifice.

Lingula spatulate, terminating in a seven-lobed apex, the terminal

* Can. Ent., Vol. XXXVII, p. 185, May, 1905.

lobe spiny and projecting between two much longer spines about 10 μ in length. Papillose for almost its entire length.

Adult.—Eyes reddish, apparently, but not nearly divided. Wings white, immaculate, semitransparent. Granular wax secretion very scanty, almost wanting, and this insect does not have the meally or floury appearance common to many species of *Aleyrodes*. Body yellow, legs and antennæ white.

Female.—Length of body about .86 mm.; length of forewing about 1 mm.; breadth of forewing about .45 mm.; hind tibia about .38 mm.

Male.—Length of body about .73 mm.; length of forewing about .93 mm.; breadth of forewing about .40 mm.; length of hind tibia about .34 mm.; length of antenna about .38 mm.

Types.—U. S. National Museum.

Cotypes.—Collection of Connecticut Agricultural Experiment Station, New Haven, Conn.

Described from 4 ♀ s, 17 ♂ s, and many pupa cases.

Habitat.—This species occurs on *Juglans*, being found on the under surface of the leaves. It was collected on black walnut, *J. nigra* at the Station July 22d, 1904, by B. H. Walden; the writer collected it at Mt. Carmel, Conn., September 24th, 1904, and at New Canaan, Conn., September 15th, 1905, on butternut, *J. cinerea*, a few specimens only occurring on a leaf. A similar species probably identical was observed by the writer at Surry, N. H., September 6th, 1902, on butternut leaves.

Named after my assistant, Mr. B. H. Walden.

Aleyrodes morrilli sp. nov.

Egg.—Unknown.

Larva.—Yellowish or greenish white, vasiform orifice yellow and darker. Oval, dorsum flat without spines, rods or other wax secretions.

Pupa.—Length about .76 mm.; breadth about .48 mm.; color light greenish yellow, empty pupa cases white, translucent, vasiform orifice darker. Broadly oval in shape, with a slight constriction or narrowing about one-third the body length from the cephalic extremity. Dorsum flat or very slightly convex, with a coriaceous, granular, or more or less wrinkled appearance, marked transversely corresponding to adult segmentation, and without spines, rods, or accretions of wax in any form. Raised from the leaf by a wall of wax about 115 μ high. Margin very finely crenulate, almost entire, with no wax fringe. At the anal extremity there is a pair of curved setæ about 22 μ in length and about 22 μ distant from each other.

Vasiform orifice subtriangular with angles rounded, about four-fifths

as broad as long. Operculum semicircular, slightly broader than long, and reaching nearly half the length of the orfiice.

Lingula spatulate, irregularly seven-lobed, rather coarsely papillose for nearly its entire length. Pair of spines about 16 μ long at extremity, one each side of terminal lobe.

Adult.—Eyes strongly constricted, but not divided. Wings white, immaculate; body, head, legs and antennæ pale yellow. Entire surface of body and wings covered with a mealy secretion of wax.

Female.—Length of body about .86 mm.; length of forewing about 1.34 mm.; breadth of forewing about .54 mm.; length of hind tibia about .38 mm.

Male.—Length of body about .76 mm.; length of forewing about 1.05 mm.; breadth of forewing about .44 mm.; length of hind tibia about .33 mm.

Types.—U. S. National Museum.

Cotypes.—Collection of Connecticut Agricultural Experiment Station, New Haven, Conn.

Described from 20 ♀ s, 9 ♂ s, and hundreds of pupa cases.

Habitat.—This species was very abundant on jewelweed, *Impatiens fulva*, in West River meadows, New Haven, Conn., in the seasons of 1904 and 1905, and a supply of material was collected by the writer on September 17th, 1905. The writer has also collected it on the same species of plant at Sunnyside, Tarrytown, N. Y., August 15th, 1904; Poquonock, Windsor, Conn., September 12th, 1904; New Canaan, Conn., October 5th, 1904; and Woodbridge, Conn., July 28th, 1905. Many leaves contained only one or two specimens, but in other cases there were between forty and fifty individuals on a single leaf. A single hymenopterous parasite was found in one of the slide preparations, but the species has not been identified.

A. morrilli is allied to *A. fernaldi* Morrill, but differs from that species in not having the dorsum of the pupa covered by an amorphous waxy secretion characteristic of *A. fernaldi*.

Named after Dr. A. W. Morrill, who has studied several species of *Aleyrodes*.

The writer here desires to acknowledge his indebtedness and to express his thanks to Professor A. L. Quaintance, who has kindly examined the specimens and the manuscript.

The accompanying plates illustrate the more important features of these three species. Plate XII is from photographs of the dried leaves, but it shows fairly well the appearance of the insects upon them. Plate XIII is from line drawings.

DESCRIPTION OF PLATES.

PLATE XII.

1. *Aleyrodes coryli* on hazelnut leaves, natural size.
2. *Aleyrodes waldeni* on butternut leaf (lower side) natural size.
3. *Aleyrodes morilli* on leaves of *Impatiens fulva*, natural size.

PLATE XIII.

4. *Aleyrodes coryli*, pupa case. X 60.
5. Margin of pupa case. X 400.
6. Vasiform orifice. X 400.
7. *Aleyrodes morilli*, pupa case. X 60.
8. Margin of pupa case. X 400.
9. Vasiform orifice. X 400.
10. *Aleyrodes waldeni*, pupa case. X 60.
11. Margin of pupa case. X 400.
12. Vasiform orifice and posterior extremity of pupa case. X 400.

Notes on Eupithecia, with descriptions of new species.

By JOHN A. GROSSBECK.

The hitherto much neglected genus, *Eupithecia*,* has suddenly been the subject of considerable study by lepidopterists, working more particularly in the Geometridæ. My own studies were directed to it because of my inability to identify specimens for correspondents, so after consultation with Mr. R. F. Pearsall, of Brooklyn, we agreed to jointly work over the group, paying special attention to the eastern species. Mr. Pearsall's collection contained quite large series of a number of species, taken for the most part in the Catskill Mountains, and we were fortunate in securing for study the material in the collections of the American Museum of Nat. Hist., New York, through the courtesy of Mr. Wm. Beutenmüller; that in the Academy of Natural Sciences, Philadelphia, through Dr. Henry Skinner,

* *Tephroclystia* of our lists.

as well as the private collections of Messrs. L. W. Swett, of Bedford, Mass., and Wm. H. Broadwell, of Newark, N. J. We are also indebted to Mr. Wm. T. Davis, of Staten Island, for the loan of a specimen identified by Mr. Grote as his *miserulata.*

My first step was to straighten out the species in the Hulst collection at New Brunswick, the result of which forms the bulk of the present paper; then Mr. Pearsall and myself worked over the material in the Brooklyn Institute Museum, following which Mr. Pearsall came to New Brunswick and corroborated most of my conclusions. At Prof. Smith's suggestion I went to Cambridge to study the Packard types, and Mr. Pearsall spent a few days at Washington in looking over the collection there, so that nearly all the types of our eastern species have been seen.

At the commencement of our work we were not aware that Mr. Geo. W. Taylor, of Wellington, was working over the species of the same general territory, believing that he was confining himself to the northwestern fauna, as far as this genus was concerned. The appearance of his paper* has therefore anticipated some of our work, and as a result Mr. Pearsall has left me to publish such of my notes as might contribute toward a better understanding of the group.

Eupithecia nebulosa Hulst (Trans. Am. Ent. Soc. xxiii, 266, 1896).

This species was described from specimens taken in New York, New Jersey and Texas. Considering the wide range given it would appear as though two species were confounded, but from a study of all the types, except the New Jersey specimen, no characters can be found that are not common to all specimens. The Texan types are rather abraded and it is obvious that the description was not drawn from them; therefore should it eventually turn out that two species are confused, the name should be held on the eastern one. All the types examined, save one from Texas, are in the Hulst collection at New Brunswick; the odd specimen is in the Brooklyn Institute Museum.

* Can. Ent., xxxix, 164.

Eupithecia palpata Pack. (Fifth Rep. Peab. Acad. Sci., 58, 1873).

This specimen was made a synonym of *E. luteata* Pack., by Packard himself in his Monograph of the Geometrid Moths. In the paper by Mr. Taylor, above referred to, it is listed as a species*, a conclusion that I myself had arrived at after a study of the types. Besides the difference in size and color, as stated by Packard, when he made the two species one, the extradiscal line in *luteata* is angulated on vein R_3, while the corresponding line in *palpata* is evenly rounded, and the palpi in the former are only half as long as in the latter. *E. columbiata* Dyar, described from British Columbia, is a close ally of *luteata*.

Eupithecia subcolorata Hulst (Can. Ent. xxx, 114, 1898).

Dr. Hulst described this species from at least three specimens representing two species. One type, a male, without locality and labelled as having been taken in August, is in the Brooklyn Institute Museum, and is the same as a male type at New Brunswick, from the San Francisco Mts., Ariz., 8-10,000 feet, July 20, 1907. To this insect Mr. Pearsall and myself agree to hold the specific name, since the underside, the maculation of which is characteristic, was obviously described from it. The third type, a female, from Arizona, August, is a smaller moth, as yet undescribed; but its condition does not warrant making it the type of a new species. In describing the upper surface of *subcolorata* Hulst drew his diagnosis largely from this species, so the description is a bad misfit to the insect, to which we have limited the name. To render the species recognizable I append herewith a redescription of *subcolorata*.

Expanse, 21 mm. Palpi and front blackish with scattered white scales; vertex almost entirely covered with whitish scales; collar white. Thorax clothed with about equal numbers of black and whitish scales, the anterior part and base of patagia wholly black. Abdomen behind first segment darker than thorax. Ground color of all wings whitish, the primaries lightly suffused with blackish scales which collect into a series of strong and contrasting black lines that form cross lines of the ground color. The first of these white lines, the basal, is double

* This position is not maintained in a continuation of his paper (Can. Ent., xxxix, 276).

separated by a fine black line and evenly rounded throughout its course. The second or intradiscal line is also geminate, broadly outcurved from costa to R_1, then curved inwardly and gently waved to inner margin forming a sharp internal angle between Cu and anal veins. The median line is represented by a narrow blackish shade line that runs directly through the discal spot; it is most prominent on the costa and bent in on vein Cu. The extradiscal line is composed of three parallel whitish lines that extend in a straight line from costa to vein R, then describe a bold outward semicircle, slightly drawn in on each vein to Cu_2, and thence proceed doubly angled to inner margin. Subterminal line dentate, not very strongly indicated. Terminal line black, broken at the veins. Fringe checkered blackish and dirty white. In the central portion of the wing in the median area the veins are strongly marked with black just inward of the extradiscal line, as in almost the whole of the Cu. Discal spot jet black, somewhat transversely elongated and pointed at the ends. Near the anal angle is a geminate white spot. Secondaries with two blackish lines crossing wing on outer half, the inner with an internal angle on anal vein. Two or three other lines on inner margin extend but a short distance into the wing. Terminal line black, contrasting. Discal spot large, black. Beneath, all wings are clear white, all the black markings of the upper surface reproduced, sharply in contrast to the white ground color.

Described from a beautiful specimen from Yavapai Co., Ariz., that agrees with the type.

Eupithecia miserulata Grt. (Proc. Ent. Soc. Phil., ii, 32, 1863).

This species has caused more trouble than any other *Eupithecia,* chiefly on account of the fact that Grote determined and distributed other better known species by that name, and it was supposed, therefore, that *miserulata* was a common form. Not until it was realized that many species of *Eupithecia* occurred in the eastern states, several of which passed as *miserulata,* was an effort made to identify Grote's species. Mr. Taylor and Mr. Swett, independently of each other, arrived at the conclusion that a certain insect was *miserulata;* while Mr. Pearsall and myself, also independently of each other, reached the conclusion that a different insect was *miserulata,* and our opinion was strengthened when we found that a specimen in the collection of Mr. Davis, determined by Grote as his species, was identical with ours. In the collection of the

Acad. Nat. Sci., at Philadelphia, where the type was said to be deposited, I failed to find a specimen labelled so; in fact, there was nothing in the collection as *miserulata,* so I believed it to be lost. Later, however, when Dr. Skinner sent me his *Eupithecia* material, I found among them a specimen entirely without label, which exactly agreed with Grote's description, except that it measured a trifle less than ¾ inches, whereas Grote gives ¾-⅞ inches. It is very likely, however, that Grote measured without the aid of a rule, otherwise he would have given exact measurements when speaking of a single example.

Now, that the type is found, it proves to be a rare insect, at least I can identify no available specimen with it, though I have one from New Brunswick, which is much the same, but lacks the black terminal line and the checkered fringes.

Mr. Swett has furnished me with several specimens, which, he says, are conspecific with Mr. Taylor's determination of *miserulata.* This is a different insect and is described herewith as *swetti,* in honor of Mr. Swett.

Eupithecia swettii n. sp.

Expanse, 21-24 mm. Length of fore wing of largest specimen (♀) 11.5 mm.; breadth from middle of costa to anal angle 5.5 mm. Outer margin almost straight; apex rather pointed. Palpi of moderate length, conic, deep brown, narrowly margined with white scales when viewed from the side; front and vertex gray, the former sometimes brownish. The joints of the antennæ above are ringed gray and dark brown. Thorax and abdomen gray, the second segment of the latter and all the abdominal tufts brown. Ground color of wings a light, even gray, sometimes (1 ♀) brownish, due to a uniform scattering of brown scales. Transverse brown lines of primaries rather indeterminate, especially in the female. Basal line evenly and strongly outcurved. Intradiscal line a series of three beginning on costa midway between base and discal spot and extending with an even outward curve to inner margin. The first of these is a little removed from the other two which are close together, and the last is heavily marked on the costa. Median line vaguely indicated, orginates at center of costa and extends outward and apparently through the discal spot below which it runs obliquely inward to inner margin being inwardly angled on cubitus and anal veins. Extradiscal line geminate, the outer line exceedingly faint and parallel with the inner which is the best defined line on the wing.

This begins on the costa in a triangular patch a little outward of discal spot and extends to vein R, then curves outward in a bold semicircle and runs inwardly obliquely to inner margin being drawn in on all the veins, the sharp angles sometimes forming dark brown dashes on the veins. Following the extradiscal line is a broad band of ground color succeeded by a dark shade which extends to the terminal line and is traversed through its center by an ill-defined zig-zag white line. Terminal line deep brown, interrupted at the veins. Fringe concolorous with ground color checkered with darker blocks. Discal spot moderate in size, dark brown, linear. Secondaries with four broad and somewhat diffuse transverse brown lines besides the deep brown, interrupted terminal line. The first two of these are within the small discal spot and extend from the inner margin well into the wing becoming then obsolete; the other two are outward of the discal spot and cross the wing completely being somewhat outwardly scalloped in their course. Fringe as in the fore wings. Beneath, the ground color is as on the upper surface and the more pronounced markings of that side are clearly reproduced beneath. Discal spots present on both wings and very distinct.

Habitat.—Sharon, Mass., April 30 to May 3; Framingham, Mass., May 7.

Types.—Five specimens, ♂ type and co-types in Mr. Swett's collection, ♀ type in the collection of the author.

Eupithecia latipennis Hulst (Can. Ent., xxx, 114, 1898).

Dr. Hulst described this from specimens received from Mr. Hanham, who collected them at Quebec, Can. I have seen three types, which are probably all there are. One of these in the Brooklyn Institute Museum, and one of the two at New Brunswick is the same as Packard's *albicopitata;* the remaining type, a male, is quite different from anything else and is left to represent Hulst's species. His description applies very well to the species as here limited.

Eupithecia absinthiata Clerk.

Mr. Taylor is entirely correct in striking this European insect from our list. He is also right in his use of the name *coagulata* Gn., for the small species, which now stands as the male type of *geminata* Pack. I have seen specimens like the one in the collection at Cambridge, which bore the reddish tinge referred to by Guenée. *Geminata* is a large *Eupithecia,* dull clay yellow in color and entirely distinct from *coagulata.*

Eupithecia fumosa Hulst (Tr. Am. Ent. Soc., xxiii, 269, 1896).

Hulst named this species from at least two specimens, citing South Abington, Mass., and Brockport, N. Y., as the localities whence the types came. There are two specimens labelled "type" at New Brunswick, one from the first mentioned locality; the second, bearing an Amherst, Mass., label, cannot be a type. Where the Brockport, N. Y. example is and whether it is like the South Abington specimen I am unable to say. It may be in the National Museum. At all events, *fumosa* is a good species, belonging to the *absinthiata* group.

Eupithecia tenebrescens Hulst (Can. Ent., xxxii, 103, 1900).

In the Monograph of Geometrid Moths, page 51, Packard described a species of *Eupithecia* as *zygadeniata,* his specimens coming from Bosque Co., Texas, March 23-24, from Belfrage, who bred them from larvæ. It appears that a specimen from Belfrage's lot found its way into Dr. Hulst's collection at a date after he (Hulst) believed he had *zygadeniata* in his possession. His determination, however, was erroneous, so he redescribed it as *tenebrescens,* new species. The type is a beautiful female specimen, evidently bred and mounted while fresh, and bears a date 20/3, in Belfrage's characteristic manner of labelling. It was not directly compared with Packard's type, but it is a striking species, and there is no room for doubt that the two names apply to one species.

Eupithecia strattonata Pack. (Fifth Report Peab. Acad. Sci., 60, 1873).

This species listed in our catalogues as a synonym of *Eucymatoge anticaria* Walk., is rightly given specific rank by Mr. Taylor. I have two specimens precisely like the type and both have but a single accessory cell, whereas all the specimens of *anticaria* I have seen have two. Badly rubbed examples of *strattonata* look something like *anticaria,* but in good specimens of both species there is hardly a point of resemblance between them.

Eupithecia gelidata Moesch. (Wien. Ent. Monats., iv, 47, 1860).

There is a Labrador specimen of this species in the Hulst collection, and I have had for comparison examples of *nanata,*

of Europe, of which Staudinger and Rebel say it is a variety. Mr. Taylor is apparently willing to accept their decision, but after careful study I would separate *gelidata* as a species principally on the course of the extradiscal line, which in *gelidata* is broadly and evenly rounded to the center of the wing, whereas in *nanata* it is angular on vein M. The lines of the hind wing, as is clearly seen from beneath, also show similar differences—sharply angled in *nanata*, almost straight in *gelidata*.

Eupithecia carolinensis n. sp.

Expanse, 18.5 mm. Palpi dark brown, short, rough scaled beneath, projecting only slightly in front of head. Entire head dark brown. Thorax grayish with some dark ochreous scales anteriorly. The abdomen is greased but is apparently dark brown with dark ochreous scales on the apex of the segments. Primaries crossed by five pairs of grayish-white lines. The basal line is evenly outcurved from costa to inner margin. The intradiscal line curves slightly outward from costa to cell, then extends inwardly obliquely to inner margin being a little waved in its course. The median pair extend sharply outward from costa, the inner line bordering the discal spot externally, then inward to Cu from where it runs inwardly obliquely to inner margin forming angles on Cu and anal veins. Extradiscal line much more evenly rounded outwardly with faint inward angles on R_5 and Cu_2. Subterminal line vaguely marked taking a dentate course through the terminal space. Terminal line very fine, scarcely darker than outer area. Fringe whitish bordering terminal line, gray on exterior portion. There are two quadrate, dark brown blotches on the costa, one internally of the median line, the other internally of the extradiscal line. The area between the inner of the double extradiscal line and the subterminal line is overlaid with a band of bright ochreous scales which on the inner margin extends across the extradiscal line to the median line. Discal spot oval, moderate in size and not very prominent. Secondaries grayish overlaid with a scattering of fuscous scales. Two wavy lines cross the wing, one through the center and one between this and the outer margin. Others are faintly indicated on inner margin of basal area. Discal spot small, round and not very distinct. Beneath, light gray, on the primaries irregularly suffused with fuscous from base to extradiscal line and again on the submarginal space, the intervening area, corresponding to the ochreous band of upper side, being pale gray. Secondaries very pale gray, almost white, the median line broad and well marked, the terminal area overlaid with fuscous. Discal spot on fore wing prominent, on hind wing almost absent.

Habitat.—Valley of Black Mts., N. C., taken by Mr. Wm. Beutenmüller on Aug. 23.

Type.—One male in excellent condition in Am. Mus. Nat. Hist., N. Y.

Differing from all known eastern species of the genus by the deep ochreous band crossing the fore wings on outer two-thirds.

Three new species of Acrididae (Orthoptera) from California.

By James A. G. Rehn.

The following new forms were contained in a series of Californian Orthoptera submitted to me by Prof. C. F. Baker.

Hippiscus sierra n. sp.

Type:—♀; Mt. Tyndall, elevation 12,000 feet, Tulare Co., California. (C. F. Baker.) [Acad. Nat. Sci., Phila.]

Closely allied to *Hippiscus calthulus* Saussure from Nevada and *croceus* Scudder from Idaho. The relationship to the former is not as close as to the latter, from which *sierra* differs in the intercalary vein being placed nearer the median than the ulnar vein, in the fusion of the axillary with the anal vein, in the much narrower, shorter and weaker fuscous band of the wing, and in the reddish instead of citron disk of the latter. The structure of the pronotum as described in *croceus* agrees very closely with the new form, which may be separated from *calthulus* by the much smaller size, the broader band of the wing, the color of the internal face of the caudal femora and that of the caudal tibiae.

Size small (for the genus); form robust. Head with the occiput not elevated; fastigium moderately declivent, about as wide as long; the cephalic width about half the median, due to the distinct subtrigonal lateral foveolae; caudal boundary of the fastigium marked by an irregular transverse carina; median carina distinct, but not high on the occiput and fastigium; interspace between the eyes about twice the width of the dorsal portion of the frontal costa; a pair of depressions are placed between the fastigium and frontal costa, which latter is narrow dorsad, expanding regularly ventrad except for a slight constriction ventrad of the ocellus, a slightly depressed area present around the ocellus but otherwise only irregularly punctate; eyes hardly prominent, subovoid in outline,

about equal to the infra-ocular sulcus in length; antennae slightly longer than the head and pronotum together, slightly depressed, the distal section not curled. Pronotum with the disk considerably flattened, the surface of the disk with irregular, usually linear rugosities; cephalic margin very broadly obtuse-angulate, caudal margin slightly acute-angulate, lateral margins of the metazona angulate but not carinate, slightly expanding caudad, metazona almost twice as long as the prozona; lateral lobes of the pronotum distinctly deeper than long, ventro-cephalic angle distinct, ventro-caudal angle broadly rounded, sulci deeply impressed. Tegmina reaching caudad of the apex of the abdomen by nearly the length of the pronotum; costal margin arcuate distad, apex rounded; mediastine vein strong, little curved; intercalary vein as a whole nearer the median than the anterior ulnar vein. Wings with the greatest width contained about one and two-thirds times in the length, costal margin slightly sigmoid, apex rounded, the axillary field arcuate in the margin; discoidal vein with three rami. Interspace between the mesosternal lobes nearly twice as broad as deep; interspace betwaen the metasternal lobes slightly narrower than the interspace between the mesosternal lobes, but somewhat shallower and as distinctly transverse. Cephalic and median limbs slender. Caudal femora moderately expanded and with carinae well developed as usual in *Hippiscus*, the ventral carina moderately but not greatly expanded mesad, the pattern of the pagina deeply impressed; caudal tibiae armed with eight to ten spines on the lateral and internal margins.

General colors mottled bistre and burnt umber. Head variegated with fine lines and threads of buffy dorsad and with a scrumbling of ecru drab ventrad; eyes tawny-olive; antennae of the general colors, darker distad. Pronotum with a considerable amount of buffy mottling on the prozona, on the lateral lobes the same portion has a median subquadrate dark patch, relieved ventrad by a pale line, metazona washed with dull maroon purple. Tegmina with a great number of small subquadrate blotches, which are congregated proximad and about mesad to form two very poorly defined bands. Wings with the disk pale geranium red, the proximal two thirds of the anterior field bistre, the transverse band rather weak and narrow, continued around to the caudal margin but not reaching the proximal one, greatest width of the band less than a sixth the length of the wing; apical third hyaline except for a slight clouding in the extreme apex. Caudal femora wood brown, with three transverse and oblique bands of bistre, the bands being distinct dorsad, but weak laterad and ventrad, the proximal one only present on the dorsal and part of the ventral face, genicular region suffused; caudal tibiae greenish yellow, the tips of the spines black.

MEASUREMENTS.

Length of body	29.	mm.
Length of pronotum	6.5	"
Greatest caudal width of disk of pronotum	5.	"

Length of tegmen	27.5 mm.
Greatest width of tegmen	6. "
Greatest width of wing	14. "
Length of caudal femur	14.2 "

The type is the only specimen of the species seen by the author.

Bradynotes excelsa n. sp.

Types:—♂ and ♀; Mt. Tyndall, Tulare Co., California, elevation 12,000 feet. (C. F. Baker.) [A. N. S., Phila.]

Allied to *B. referta* Scudder from Logan Co., Idaho, and mountains near Lake Tahoe, California, but differing in the narrower interspace between the eyes, in the frontal costa being hardly wider dorsad than the basal antennal joint; in the metazona being twice as long as the prozona, in the length of the pronotum being contained three times in the length of the caudal femora and in the absence of an abdominal carina.

Size small; surface sub glabrous. Head with the occiput rounded; interspace between the eyes no wider than the inter-antennal width of the frontal costa (♂) or about half again the width of the same (♀); fastigium very strongly declivent, very broadly and shallowly sulcate in both sexes, the sulcation extending caudad between the eyes; frontal costa subequal, no wider (♂) or slightly wider (♀) than the proximal antennal joint, undefined ventrad of the ocellus, biseriate-punctate dorsad, not sulcate; eyes moderately prominent in the male, less so in the female, short ovate in outline in both sexes, cephalic margin more flattened in the female than in the male, in length equal to (♀) or slightly longer than (♂) the infra-ocular sulcus; antennae about equal to the length of the head and pronotum in the male. Pronotum rounded; cephalic margin truncate with a very slight median emargination, caudal margin very broadly and shallowly emarginate, lateral angles rounded and no carina present; median carina indicated by the faintest possible trace on the cephalic section of the prozona and on the metazona; transverse sulci impressed, particularly the principal (caudal) sulcus; prozona in both sexes over twice the length of the metazona; lateral lobes slightly longer than deep; ventral margin rounded with a very slight cephalic sinuation. Mesonotum with the caudal margin slightly arcuate in the male, very slightly emarginate mesad in the female; metanotum truncate in the male, distinctly emarginate mesad in the female. Prosternal spine very short, thick and blunt; interspace between the mesosternal lobes over half again as broad as long (♂) or twice as broad as long (♀). Tegmina and wings absent in both sexes. Abdomen somewhat compressed, not carinate, apex moderately elevated and slightly recurved in the male; furcula of the male extremely small, divergent; supra-anal

plate of the male, with the margins regularly but not greatly converging in the proximal two-thirds, distad of which they approach one another much more decidedly, apex rounded, median paired carinae regularly converging from the base; cerci simple, tapering in the proximal three-fourths, subequal in the distal fourth and slightly curved ventrad in that section, apex blunt; subgenital plate very broad, the margin not passing through the apex which is produced, trigonal, blunt and somewhat flattened dorsad, when viewed laterad slightly curved dorsad. Cephalic and median femora much more robust in the male than in the female; caudal femora moderately slender; caudal tibae with eight spines on lateral margin.

General color vandyke brown dorsad, cinnamon (♂) or wood brown (♀) ventrad, the male being wholly suffused with a rufescent coloring. Head with distinct blackish post-ocular bars as well as a pair of blackish occipital maculations; eyes burnt umber (♂) or drab (♀); antennae burnt sienna (♂) or wood brown (♀). Pronotum with the post-ocular bars continued across its whole length and reaching to the caudo-lateral angle of the pleura, in the female two spots of ecru drab on each side being enclosed in the blackish bar; disk of the metazona lighter in color than the prozona in both sexes. Mesonotum and metanotum dark mesad, pale laterad; pleura almost uniform, very dark brown, this being a continuation of the pronotal bars. Caudal femora with two rather broad dark brown transverse bars which follow the lines of the paginae in crossing the lateral face, being thus < shaped, genicular region very dark, internal face and ventral sulcus scarlet vermilion except for a narrow pale pregenicular annulus; caudal tibiae ochraceous, infuscate proximad, spines and spurs tipped with black.

MEASUREMENTS.

	♂	♀
Length of body	16.5 mm.	18.8 mm.
Length of pronotum	2.8 "	3. "
Greatest width of disk of pronotum	2.8 "	3.6 "
Length of caudal femur	9.2 "	10.5 "

A paratypic male has been examined in addition to the types.

Oédaleonotus truncatus n. sp.

Types:— ♂ and ♀; Mountains near Claremont, Los Angeles Co., California. (C. F. Baker.) [A. N. S., Phila.]

A member of this genus but not at all closely related to *Oe. enigma*, the only previously known species of the genus. The character which immediately strikes one in both sexes of the species is the truncate caudal margin of the pronotum and

the greater longitudinal arching of the same. In the male the more rounded eye, the narrower interocular space and frontal costa, more prominent lateral angles of the pronotum and the longer, more attenuate cerci will separate the new form. In the female the caudal expansion of the pronotum, the more prominent lateral angles of the pronotum and the longer lateral lobes, as well as the longer and somewhat slenderer caudal femora, will distinguish *truncatus* from *enigma*.

Size rather small; form moderately compressed and slender for the genus. Head with the occiput arched and slightly, but distinctly, elevated above the general level of the disk of the pronotum; interspace between the eyes not (♂) or very slightly (♀) wider than the inter-antennal portion of the frontal costa; fastigium moderately declivent, distinctly sulcate in both sexes, though more deeply and with sharper lateral margins in the male; when viewed laterad the fastigium rounds into the line of the face, which is slightly produced between the antennae; frontal costa at the junction with the fastigium hardly wider than the proximal joint of the antennae, regularly expanding ventrad to the ocellus, not marked ventrad of this, slightly depressed around the ocellus, not sulcate but biseriate-punctate; eyes ovate, more flattened cephalad in the female than in the male, in both sexes very distinctly longer than the infra-ocular sulcus, when viewed from the dorsum the eyes are moderately prominent in the male; antennae almost equalling the head and pronotum in length in the female. Pronotum subdeplanate dorsad in the male, slightly tectate in the female; cephalic margin of the disk subtruncate, caudal margin subtruncate with a very slight median emargination, lateral margins angulate but not carinate, the angle somewhat rounded on the metazona of the female; median carina distinct in both sexes, evanescent between the sulci, weaker in the female than in the male, prozona half again as long as the metazona in the male, slightly less than half again as long in the female; transverse sulci more marked in the male than in the female; disk of the pronotum of a greater width caudad in the female than proportionately in the male; when viewed laterad the dorsal outline of the prozona is slightly but distinctly arcuate; lateral lobes distinctly longer than deep, the cephalic margin gently arcuate, the caudal slightly sinuate, both converging, ventral margin very broadly and bluntly angulate; metazona on dorsum and lateral lobes closely and sharply punctate. Tegmina abbreviate; lateral, not attingent dorsad, nearly twice as long as broad in the male, half again as long as broad in the female, apex obliquely subtruncate. Abdomen tectate in both sexes, slightly (♀) or strongly (♂) compressed, apex recurved in the male; form of the furcula cannot be ascertained on account of the strongly recurved apex; cerci rather broad, subequal in the proximal third, tapering regularly thence to the narrow but blunt apex, which also has a slight curve toward the

median line; supra-anal plate trigonal, slightly longer than wide, apex rather blunt: subgenital plate broad, the apical margin U-shaped, a slightly elevated rugose area is situated cephalad of the margin proper. Prosternal spine conical, slightly depressed. Interspace between the mesosternal lobes slightly longer than broad in the male, subquadrate in the female; interspace between the metasternal lobes small in the female, the lobes subcontiguous in the male. Cephalic and median femora considerably inflated and bowed in the male. Caudal femora reaching beyond the apex of the abdomen in both sexes, moderately inflated, the greatest width contained more than three times in length; caudal tibiae with nine spines on the lateral margins.

General color of the male clay color marked with clove brown. Eyes prout's brown; postocular bars continued across the dorsal section of the lateral lobes of the pronotum, deep and irregularly delimited ventrad on the prozona, very narrow and sharply defined on the metazona, the disk of the pronotum also slightly infuscate mesad. Pleura clove brown; the mesosternum and a line on the carina of the metapleura of the general color. Tegmina isabella color margined ventro-proximad with clove brown. Abdomen in the proximal half strongly washed laterad with clove brown. Caudal femora with the lateral and internal faces with three blotches of clove brown, the genicular arches weakly washed with the same color, ventral sulcus scarlet vermilion; caudal tibiae verditer blue, spines cream-buff tipped with black; tarsi soiled buff.

Female with the general color bistre, isabella color on the face and venter, postocular bar narrow and not sharply defined; caudal femora with no markings, but the ventral sulcus similar to that of the male only somewhat duller; caudal tibiae dull glaucous-blue, irregularly and rather minutely mottled with brown.

Measurements.	♂	♀
Length of body	17.2 mm.	21.5 mm.
Length of pronotum	4.5 "	5.5 "
Greatest caudal width of disk of pronotum	3. "	4.3 "
Length of tegmen	3.4 "	3.1 "
Greatest width of tegmen	1.8 "	2 6 "
Length of caudal femur	11.5 "	13.2 "

In addition to the types a single paratypic female has been examined. This specimen is slightly larger than the female type, of a lighter general color, the yellow tint being more apparent, and with the blue of the caudal tibiae much deeper. The tegmina are also slightly shorter, but the differences are of interest only to show that the species varies in size, somewhat in minor structural characters like the proportion of the tegmina and also in color.

Contributions to the knowledge of Rhynchophora.*

By W. Dwight Pierce, U. S. Bureau of Entomology.

(Paper No. 1, Part I.)

Considerable work has been done during the past year by the members of the Cotton Boll Weevil Investigation commission upon the biology of weevils and their parasites. The purpose in view has been to throw side lights upon the biology of *Anthonomu grandis*, and also to obtain parasites which might be propagated upon the weevil. The result has been very favorable, as is shown in a bulletin of the Bureau of Entomology just prepared for publication by the writer. The miscellaneous notes obtained, which are foreign to the subject matter of that bulletin are embodied in the present paper.

It may be asserted with propriety that considerable light will be thrown upon the systematic relationships of insects by breeding work. In a group of weevils such as the Barini, where the species are very close, a study of the breeding habits and of the characters displayed by the immature stages is necessary in order to obtain the correct definition of closely related species.

CLEONINI.

LIXUS Fabr.

1. **Lixus musculus** Say.

A few notes were obtained on this species in addition to those published in Bull. 63 of the Bureau of Entomology.

A few galls of this weevil were found October 2 and 20, 1906, at Dallas, Texas. Four galls were found, all parasitized.

Parasites.

Glyptomorpha rugator Say (det. by Dr. W. H. Ashmead). This Braconid evidently is in the habit of hibernating in its cocoon as a pupa. From cocoons isolated in cell, September 28, 1905, parasites were bred as follows: April 21st, two males; April 25th, one female; April 30th, one female; May 3rd, two females; May 8th, one female; May 24th, one female; June 12th, one female. The material was collected at Clarendon, Texas.

* This paper deals with the incidental work of the Bureau of Entomology, through its Dallas, Texas, laboratory.

Cerambycobius cyaniceps Ashm. (det. by Dr. W. H. Ashmead. One female of this Eupelmine was bred from a weevil larva from which six other parasites of another species were also bred. This is the first time the writer has bred more than one species of parasite from a single weevil individual. The gall was collected at Dallas, October 2nd, the pupa of the parasite being observed first October 12th, and becoming adult October 26th.

The other parasites formerly bred were *Neocatolaccus tylodermа* Ashm. and *Eurytoma tylodermatis* Ashm., both primarily parasitic on stem weevils.

2. **Lixus scrobicollis** Boh.

This weevil is found to breed in the stems of *Ambrosia psilostachya* and *trifida* throughout Texas. The eggs are laid close together in a slit in the stalk, and the larvæ burrow throughout the stem making their cells sometimes very close together. Oviposition occurs in the spring, but the pupæ have not been found before October 11th. They probably hibernate as pupæ or adults in the stem.

PARASITES.

Glyptomorpha rugator Say was bred by Mr. W. W. Yothers from Victoria material, April 17, 1905.

ERIRHININI.

DESMORIS Lec.

Desmoris scapalis Lec. is a species closely resembling the boll weevil, *Anthonomus grandis* Boh., and is frequently mistaken for that species by the people at large. It breeds in the seed heads of *Sideranthus rubiginosus*, the egg being inserted through the involucre among the seed. The presence of the developing larva is indicated frequently by the darkening of the bracts through which the ovipositor passed. The larva feeds entirely upon the ripening seeds making a spherical cell of exuvial material which becomes very hard, due to the hardening of the natural gum of the flower. When the seed are ripe they are ejected and with them falls the larva in its cell. It immediately enters the ground, making a small earthen cell

in which it hibernates and in the following spring pupates. Parasitism occurs only upon the larvæ in the flower head, as far as is known. The adults have been taken in copula June 6th at Corsicana, Texas. During June and the early part of July the adults are mainly engaged in feeding upon the tender, succulent terminal buds. The *Sideranthus* does not flower much before the first of August, at which time oviposition commences. The larvæ enter the ground in August, September and October. In the spring of 1906, from material collected September 19, 1905, at Mexia, Texas, the following data were obtained. Larvæ were found as late as July 2nd, while the first pupa was obtained May 29th, and the first adult June 28th. On July 2nd there were found three larvæ, one adult, four teneral adults and three mature adults in cells.

PARASITES.

Bracon mellitor Say, *Bracon mellitor dorsator* Say (det. by J. C. Crawford). From the Mexia material, F. C. Pratt bred one female of the typical red form, also one male, and one female of the smaller dark form, September 20, 1905; one typical female and one dark male, September 29, 1905. One female was bred from Calvert material, September 23, by Mr. Pratt.

ASSOCIATED SPECIES.

Lygranthœcia mortua Grote (det. by Dr. H. G. Dyar). A large Noctuid occurs in large numbers in the heads of the *Sideranthus*. The caterpillars generally clean out several heads during their period of development, and in so doing kill a large number of the *Desmoris* larvæ. If any of these caterpillars are allowed to remain in the breeding cage they destroy every weevil larva present. They enter the ground when full grown and spin a very loose silken cocoon within their elongate cell of earth and then pupate. Hibernation takes place in this stage. The first moths were bred September 6, 1906, from material collected September 19, 1905, at Mexia.

Smicronyx tychioides Lec. was bred from stem galls on dodder by A. C. Morgan and C. R. Jones at Victoria, Texas. The galls were first collected August 1, 1906. The larvæ when

fully developed leave the gall and enter the ground for pupation. They are in the ground approximately sixteen days before maturity.

ANTHONOMINI.

ANTHONOMUS Germ.

Anthonomus fulvus Lec. In addition to notes published in Bulletin 63 of the Bureau of Entomology the following may be given: the breeding period commences early in May and extends a short time beyond July 12th.

PARASITES.

Bracon mellitor Say was previously recorded as a primary parasite.

Catolaccus incertus Ashm. was also bred from this weevil June 14, 1905, at Dallas, Texas, by W. W. Yothers.

Anthonomus æneolus Dietz. The typical material in this species was bred by Mr. E. A. Schwarz at Columbus, Texas, from leaf galls on a *Solanum*, probably *S. elæagnifolium*. At Dallas, Texas, the writer has bred a species which is apparently the same from the buds of *Solanum torreyi*. The eggs are laid in the buds, and the larvæ develop entirely in the interior of a single anther, or of two anthers cemented together. The flower generally opens normally, and it is probably that fertilization frequently takes place. Pupation takes place in the anther, generally after the bud or corolla has dropped. The pupal period is not over six days. This *Solanum* commences to bud early in May, and by June 15th is about entirely out of bloom. In the latter part of June *Solanum elæagnifolium* commences to bloom and the weevils then attack it, after the same manner as the preceding plant. By July 1st *Solanum rostratum* is in bloom, continuing in season until fall. In it the larvæ seems generally to be confined to the large double anther. They are not as abundant as in the spring upon *Solanum torreyi*.

PARASITES.

Catolaccus incertus Ashm. (det. by J. C. Crawford) was bred as the predominant primary parasite.

Anthonomus nigrinus Boh. Buds of *Solanum carolinense* containing immature stages of this species were collected by F. C. Chittenden at Washington, D. C., for the purpose of breeding parasites. The larvæ work differently from those of the preceding species in that they make their cell in the centre of the narrow bud, through the pistil and anthers, thus preventing the opening of the flower, and causing an early dropping of the infested buds. An examination of material collected about July 3rd yielded one hundred and eleven weevil stages, of which 18 or 16.2% were parasitized.

PARASITES.

Catolaccus incertus Ashm. Quite a number of specimens of this species were bred.

Anthonomus squamosus Lec. This weevil was found by the writer breeding in the flower heads of *Grindelia inuloides* at Dallas, Texas, August 4, 1906, and was identified from its pupa. A larva presumably of this species was found in a flower head of *Grindelia grandiflora* Hook. (det. by C. F. Wheeler), collected at Paris, Texas, September 2, 1905, by F. C. Bishopp.

ASSOCIATES.

Rhagoletis grindeliae Coq. Two specimens of this new fly were bred June 2, 1906, from cells in the heads of *Grindelia squarrosa nuda* collected at Clarendon, Texas, September 19, 1905. The external indication of the presence of this insect is identical to that of *Anthonomus squamosus*. The larva makes a little cell among the seed. It is white, with both apices flat and black.

Agromyza jucunda Walk. (det. by Mr. Coquillett). One specimen of this fly was bred from the flower heads.

Urellia maverna Walk. (det. by Mr. Coquillett). Several specimens of this beautiful fly were bred. The robust white larvæ, with head and apex of abdomen flattened and black, appear like little barrels. They occupy cells very similar to those made by *Anthonomus squamosus*, and their presence is indicated in the same manner. The pupæ are brown. These flies were bred during September, 1905. The biology is short.

Eupelmus clynii French (det. by Dr. W. H. Ashmead). One specimen of this parasite was bred. Its host is not known.

Polynema œcanthi Ashm. was found to be an abundant parasite of *Œcanthus* eggs in the stems of the *Grindelia*.

Lygranthœcia mortua Grote (det. by Dr. H. G. Dyar). One specimen of this moth was bred September 2, 1906, from a pupa which was formed in September, 1905. This moth pupates in the ground in a little silken cocoon. This individual is smaller and lighter in color than those bred from *Sideranthus rubiginosus*.

Cydia grindeliana Busck. The type material of this species was found breeding in large numbers in the flower heads of the *Grindelia*. The entire metamorphosis is passed in one flower, where it feeds in the larval stage upon the seed. When young of *Anthonomus* occur in the same flower head they are very likely to be devoured by larvæ of this Tortricid.

Anthonomus albopilosus Dietz.—This species was found to breed in the seed of *Croton capitatus* and *Croton engelmanni*, and probably of *Croton texense*. It was found breeding at Johnson's Bayou, Louisiana, August 26, 1906; Olivia (Calhoun Co.), Texas, September 2; Victoria, Texas, September 6; Texarkana, Arkansas, September 10, by J. D. Mitchell; and at Leesville, Louisana, September 29, by F. C. Bishopp. The larvæ generally clean out the interior of one seed and then pass to a second, and sometimes the third, in which they pupate. The developmental period is probably not longer than one month.

PARASITES.

Catolaccus incertus Ashm. is the principal parasite. It was bred from the Johnson's Bayou and Leesville material.

Cerambycobius cyaniceps Ashm.—Two females were bred from the Johnson's Bayou material.

Bracon mellitor Say.—One specimen was bred by Mr. Mitchell at Victoria.

MACRORHOPTUS Lec.

Macrorhoptus estriatus Lec.—This species was found to breed in the seed capsules of *Callirrhoë involucrata*. It occurs from Dallas to Sinton (San Patricio Co.), Texas. The adults are

frequently found in the flowers. The egg puncture resembles that of *Anthonomus grandis* in its wart-like appearance. Larvæ were first found June 10th at Dallas, and adults were bred between June 20th and July 15th. At Sinton, Texas, Mr. Mitchell took adults in copula March 29th.

TYCHIINI.

TYCHIUS Sch.

Tychius sordidus Lec.—This species was found breeding in the seed pods of *Baptisia leucantha* at Logansport, Louisiana, June 7, 1906, by the writer. The larvæ were found in the pods feeding externally upon the seeds, and were decidedly yellowish in color. As many as three were found in one pod. The larvæ left the pods and entered the ground on and after June 15th. Pupæ and adults were found in the cells July 6th. The pupæ are at first yellow, becoming tinged with red on the thorax and head, toward maturity.

CRYPTORHYNCHINI.

CONOTRACHELUS Sch.

Conotrachelus affinis Boh. and *C. posticatus* Boh. were bred from prematurely fallen hickory nuts collected June 8, 1906, at Logansport, Louisiana, by the writer. The larvæ clean out practically the entire nut and then enter the ground for pupation. Adults were bred July 5th.

Parasites.

Myiophasia ænea Wied. (det. by W. D. Hunter and D. W. Coquillett). One specimen of this Tachinid was bred July 6th as a primary parasite.

Associates.

Siphonella inquilina Coq.—Quite a number of this little fly were bred from the nuts. The eggs are laid in the imperfectly closed egg puncture of the weevil. The larvæ follow in the burrow of the weevil, sometimes overtaking it and probably killing it.

CEUTORHYNCHINI.

AULEUTES Dietz.

Auleutes tenuipes Lec.—This species was found by the writer to breed in the buds of *Galpinsia hartwegi* at Dallas, Texas. The eggs are placed in the very small buds without an external trace of the puncture. The buds neither wilt, nor fall, nor discolor, for the larvæ dwell exclusively in the interior of the long anthers which in the bud lie longitudinally. They start at the lower end and eat upwards and are frequently still in the anther when the flower opens, yet they are seldom killed by exposure to the sun. The larvæ are white when very small and yellow when older. At all stages they are possessed of a remarkable ambulatory power, emitting a liquid through which they can glide. They probably can go from flower to bud, because some seen in open flowers were very minute, and small holes were frequently found in buds which contained larvæ. The flower falls the day after blooming, but the larvæ probably leave before then. When full grown they enter the ground and form a very small earthen cell in which they pupate. The longest period from collection of buds to maturity of adult was 17 days, the pupal period being about 7 days. The first larvæ were found May 11, 1906, the first pupæ May 18th, the first adults May 28th, being bred from then on until June 29th.

Parasites.

Catolaccus incertus Ashm. (det. by J. C. Crawford) was bred frequently as a primary parasite. The larvæ of this species pupate in the bud or flower.

Mr. E. T. Cresson, Jr., Librarian of the American Entomological Society, will visit the western part of the United States this fall. He is making a study of the Diptera and is specially interested in Muscidae.

A very important paper has been published by Mr. F. D. Godman in the Annals and Magazine of Natural History, Ser. 7, Vol. xx, 1907, on the American Species of Hesperidæ, described by Plötz. This work makes it possible to know what the many species described by Plötz really are.

ENTOMOLOGICAL NEWS.

[The Conductors of ENTOMOLOGICAL NEWS solicit and will thankfully receive items of news likely to interest its readers from any source. The author's name will be given in each case, for the information of cataloguers and bibliographers.]

To Contributors.—All contributions will be considered and passed upon at our earliest convenience, and, as far as may be, will be published according to date of reception. ENTOMOLOGICAL NEWS has reached a circulation, both in numbers and circumference, as to make it necessary to put "copy" into the hands of the printer, for each number, three weeks before date of issue. This should be remembered in sending special or important matter for a certain issue. Twenty-five "extras," without change in form, will be given free, when they are wanted; and this should be so stated on the MS., along with the number desired. The receipt of all papers will be acknowledged.—ED.

PHILADELPHIA, PA., OCTOBER, 1907.

The Seventh International Zoological Congress held in Boston, Massachusetts, from the 19th to the 24th of August is now a matter of history. We were gratified to see the number of papers presented on the various branches of entomology, about twenty-five. This is a very creditable showing for this branch of Zoology. The abundance of insects, both as to species and individuals, and their vast economic importance is going to create an immense interest and rapid growth of the study. Many entomologists were in Boston during the Congress and they comprised about one-fifth the entire attendance. The meeting of The Entomological Society of America was a factor in this, but nevertheless it shows the present interest and we predict that the time is rapidly coming when entomology will leave far behind some of the studies in Zoology that at present have comparatively many devotees. In the future an entomologist will be looked upon with more respect and only the illiterate will speak of bugs and bugology.

It is with interest that I note Mr. Brehme's remarks on *Thecla damon* and his proposed name for the black variety—*patersonia*. Some less local name might have been chosen. I have taken this dark form here in Montgomery County, Virginia, in late July, and I have taken it in early April, on the sea-coast islands at Charleston, South Carolina. I have, at present, two specimens in my collection, a South Carolina ♂ and a Virginia ♀; both are evenly dark colored above, a dead wood-black; below, the green is less vivid than in the normal form, being more bronzy in tone. The Virginia specimen is very large.—ELLISON A. SMYTH, JR., *Blacksburg, Va.*

Notes and News.

ENTOMOLOGICAL GLEANINGS FROM ALL QUARTERS OF THE GLOBE.

DR. J. F. MCCLENDON has been employed as Resident Naturalist to the Marine Biological Association of San Diego, California, this past summer.

PROF. E. D. SANDERSON, Professor of Zoology and Entomology, has been made director of the Experiment Station at New Hampshire College and C. S. Spooner, Assistant Entomologist.

WHO LIVES IN CECROPIA COCOONS?—In looking over a mass of *cecropia* cocoons, I was surprised by finding scores of the tiny, pearl-gray, globular cocoons of *Chrysopa* attached to all parts of the outside of the looser cocoons of *cecropia*. The flies emerged, most of them, within two days of my bringing the cocoons to a warm room. A fine *Ichthyura apicalis* emerged from one of the medium-sized cocoons, and a little dead beetle tumbled out of another which I was cutting open. Two or three small egg-masses of spiders were just inside the loose mouths of small cocoons. It would be interesting to know what creatures winter in cecropias door-ways.—CAROLINE GRAY SOULE.

CORRECTIONS AND ADDITIONS to Andrenae of the Canadian, Alleghanian and Carolinian Plant Zones occurring or likely to occur in Connecticut (see July number ENT. NEWS, 1907).

Page 280, between lines 6 and 7 from bottom, insert Facial fovea more than one-half as wide as the distance between the lateral ocellus and nearest eye margin . . . . . 6.

" 281, to line 6 from top, between "line" and "15" add: or line drawn from lowermost margin of antennal fovea to lowermost margin of its fellow.

" 281, line 4 from bottom, change "golden or brown" to brown, abdomen appearing bare.

" 281, at bottom of page, add as alternative to two preceding alternatives:

Like *nivalis* in most points, but abdomen sericeous.
Anal fimbria brown . . . . . **perplexa viburnella.**
Anal fimbria golden . . . . . **pruni.**

" 283, change **mandibularis** to **thaspii.**

" 285, line 17 from bottom, change "or" to plus (+).

" 286, lines 5 and 6 from bottom, strike out = *viburnella* = *pruni* = *dunningi*; at bottom of same page add *Andrena pruni* Rob. (= *dunningi*) and *Andrena perplexa viburnella* Graen.

" 287, transpose *vestita* so line will read *Andrena nasoni* (= *vestita* = *hartfordensis*) and change *mandibularis* (= *thaspi* to *thaspii.*

NOTE ON THE NAME OF THE PEPPER-WEEVIL OF MEXICO AND TEXAS.—Dr. Alfred Duges, of Guanajuato, in a letter of June 3, 1907, informs me that the "Pepper-Weevil" (*Anthonomus aeneotinctus* Champ.), should be known by the name of *Anthonomus eugenii* Cano., and in this I have no doubt he is correct. Donaciano Cano's figures and description of *A. eugenii* [La Naturaleza, Series 2, ii, pp. 377-379, t. 17 (1894)] have never been noticed in the "Zoological Record," and of course had not been seen by me. His figure of the insect would apply equally well to various allied Mexican forms, but as some of our specimens of *A. aeneotinctus* (described in the Biologia in 1903) were received from the same locality—Guanajuato—from M. Sallé, they are almost certain to belong to the same species. According to Cano, *A. eugenii* attacks various "chiles" (*Capsicum*). The larva (fig. 1), pupa (fig. 2), insect (fig. 3), anterior leg (fig. 4) and apex of rostrum (fig 5) are figured by him in the Naturaleza. The insect is known as the "barrenillo" in Mexico.—G. C. CHAMPION, Horsell, Woking, England.

AT AN informal entomological dinner held at the residence of Mr. Victor L. Clemence, Pasadena, Cal., on Thursday evening, July 11, 1907, the following were present: Mr. William S. Wright, of San Diego; Mr. E. K. Harvey, Mr. O. W. Howard and Mr. V. W. Owen, of Los Angeles; Mr. Don. White, Mr. Don. Ross, Prof. H. C. Fall, Mr. V. L. Clemence and Mr Fordyce Grinnell, Jr., of Pasadena. A sumptuous and elegantly served dinner occupied the time from 6.30 to 8 P. M. Neat souvenir cards, representing different butterflies, with the names of the guests, were arranged at the respective places at the table. Other entomological diversions added to the interest, combined with more technical entomological discussion. From 8 to 11.30, when the meeting adjourned, enthusiastic and informal discussion on entomological subjects was indulged in by the persons present. Mr. Owen, who has just returned from Arizona, and Mr. Wright, of San Diego, had much of interest to say. Mr. Harvey exhibited a box of tropical Mexican insects illustrative of mimicry and protective resemblance, and Mr. Clemence's well-arranged and suggestive collection was shown. Those present went away with renewed entomological enthusiasm, and it was voted to hold more of these gatherings in the future.—FORDYCE GRINNELL, JR.

OVIPOSITION OF *Languria mozardi* Latreille—A female of this species was observed on June 23d, 1903, at Blacksburg, Virginia, ovipositing into the stem of a species of *Leucanthemum*. It was first found busily engaged in excavating a hole or improving an already excavated one, about 2 millimeters in diameter. Upon approach of the observer it became frightened, but after his remaining perfectly quiet for a short time the beetle renewed its activity. The method followed was very simple, and on that account of interest.

After preparing the nidus, the female leisurely walks up the stem

the length of her body, and after feeling a little, fits the tip of the abdomen into the excavation and places an egg. After deposition she wheels in her tracks with almost military precision, simply reversing her position and commences to prepare another place for an egg in the same excavation. The female works with economy, wheeling about each time, so that the tip of the abdomen approached the excavation at each deposition, and then again to the rear, so that the jaws would strike the excavation when about to prepare a place for the next egg. Thus, in preparing the cavity, the beetle was facing up, with her body below it; when about to deposit the first egg she simply moved forward the length of her body, and afterwards simply wheeled in her tracks, when about to prepare a place for the second egg. The succeeding depositions were executed by wheeling about each time. Therefore, each completed movement, consisting of two wheels to the rear, accomplished the deposition of two eggs, occupying about 4½ minutes.

During the observation the female deposited at least 15 eggs, using the same nidus, and being engaged on the eighth completed movement. The specimen was determined through the kindness of Dr. L. O. Howard.—A. A. GIRAULT.

AN EVIL-SMELLING BEETLE.—For a number of years past the writer has been receiving accounts from his friends, who make their summer homes on the shores of Muskoka Lake, of a certain insect, which is said at times to occur quite numerously and to emit a fearfully repellant odor. Several attempts to identify the insect have been made at my request, and specimens of various lepidoptera, diptera, hymenoptera, and hemiptera have been submitted to the writer, all of which were unmistakably incapable of producing the nauseous exhalations which were complained of. Recently, however, the true offender has come to hand, and it turns out to be the small carabid beetle known to science as *Nomius pygmaeus* Dejean, and it should be called the polecat of the coleoptera. There is only one species of the genus known. It occurs in southern Europe and in many places in our own country from Georgia to California and as far north as Lake Superior. According to Dr. LeConte the beetle "exhales a strong, fetid odor." The specimens received in the mail, which are before me as I write, do indeed exhale an exceedingly strong odor, comparable to that of a mouse well advanced in the process of decomposition. I can well understand that the tenants of the beautiful cottages about Beaumaris, if these insects are numerous, must be at times greatly annoyed by them.—W. J. HOLLAND.

THE HEADQUARTERS of the Newark Entomological Society, on the fourth floor of the Newark Turn Hall, was completely destroyed by fire in the early morning of June 3d, 1907. The conflagration demol-

ished not only the entire building, but also resulted in the loss of three lives.

The property of the Society consisted of a forty drawer cabinet containing one thousand specimens of Lepidoptera and two thousand five hundred specimens of Coleoptera, mostly representing local forms, besides a small collection in other orders; also a book case with one hundred and ten bound volumes and three hundred and sixty-five unbound volumes and pamphlets. All of this property was consumed by the flames except a few books that were in the hands of members. This collection of publications and insects was the accumulation of over twenty years of the Society's existence, and as the loss was only partially covered by insurance it will be a long time before it can be replaced. Some of the books, perhaps, can never be obtained again.

The Society will be exceedingly grateful for any help in the way of rebuilding the library that may be given it. Entomologists are earnestly invited to send separates of their papers or other publications that they may have in duplicate for which the costs of transmission will be gladly refunded. Until the Society is again established in permanent quarters, parcels should be addressed to the secretary at New Brunswick, New Jersey.—JOHN A. GROSSBECK, *Secretary.*

Doings of Societies.

The second meeting of the Entomological Society of America was held in the rooms of the Boston Society of Natural History on the evening of August 22, 1907. The following members were in attendance:

Prof. John Barlow, Kingston, R. I.
Rev. Prof. C. J. S. Bethune, Guelph, Ontario.
Mr. William Beutenmuller, N. Y. City.
Mr. C. V. Blackburn, Stoneham, Mass.
Mr. J. C. Bradley, Berkeley, Cal.
Mr. A. F. Burgess, Boston, Mass.
Mr. Erich Daecke, Phila., Pa.
Mr. N. S. Easton, Fall River, Mass.
Mr. J. H. Emerton, Boston, Mass.
Mr. G. P. Engelhardt, Brooklyn, N. Y.
Prof. C. H. Fernald, Amherst, Mass.
Prof. H. T. Fernald, Amherst, Mass.
Mr. W. L. W. Fielde, Boston, Mass.
Mr. C. A. Frost, South Framingham, Mass.
Mr. F. Haimbach, Phila., Pa.
Dr. Thomas J. Headlee, Durham, N. H.
Mr. E. F. Hitchings, Waterville, Me.
Dr. W. J. Holland, Pittsburg, Pa.
Mr. C. W. Johnson, Boston, Mass.
Prof. Vernon L. Kellogg, Leland Stanford, Cal.
Prof. Trevor Kincaid, Seattle, Wash.

Mr. F. E. Lutz, Cold Spring Harbor, N. Y.
Mr. H. H. Lyman, Montreal, Canada.
Mr. B. P. Mann, Washington, D. C.
Mr. C. L. Marlatt, Washington, D. C.
Prof. A. P. Morse, Wellesley, Mass.
Mr. H. H. Newcomb, Boston, Mass.
Prof. Herbert Osborn, Columbus, O.
Miss Edith M. Patch, Orono, Me.
Prof. R. C. Osburn, New York City.
Dr. F. W. Russell, Winchendon, Mass.
Prof. E. D. Sanderson, Durham, N. H.
Dr. Henry Skinner, Phila., Pa.
Prof. J. B. Smith, New Brunswick, N. J.
Mr. F. M. Webster, Washington, D. C.
Dr. Wm. Morton Wheeler, New York City.

In addition the following visitors were present:

Dr. G. Horvath, Budapest.
Prof. N. J. Kusnezov, St. Petersburg, Russia.
Prof. G. A. Severin, Bruxelles.
Dr. R. Heymons, Berlin.
Mr. F. Bates.
Prof. and Mrs. T. D. A. Cockerell, Boulder, Colo.
Mr. E. C. Cotton, Knoxville, Tenn.
Mr. W.F. Fiske, Washington, D. C.
Mr. J. Arthur Harris, St. Louis, Mo.
Mr. G. V. Pindar, New York City.
Mr. L. R. Reynolds, Boston, Mass.
Mr. A. C. Sampson, Sharon, Mass.
Mr. L. W. Swett, Bedford, Mass.
Mr. A. G. Weeks, Boston, Mass.
Mr. R. K. Wolcott, Lincoln, Neb.
Mr. Chas. Zeleny, Bloomington, Indiana.

The following were in Boston during the meetings:

Dr. R. Blanchard, Paris, France.
Dr. H. G. Dyar, Washington, D. C.
Dr. L. O. Howard, Washington, D. C.
Mr. J. E. Bates, Whitman, Mass.
Prof. A. F. Conradi, College Station, Texas.
Dr. E. A. Goeldi, Para, Brazil.
Mr. R. H. Johnson, Cheney, Wash.
Mr. J. Martin, New York State.
Mr. E. H. Forbush, Malden, Mass.
Mr. H. C. Weeks, Gilman, New York.
A. H. Kirkland, Boston, Mass.
Mr. S. Henshaw, Cambridge, Mass.
Mr. M. Wirtner, Penn Station, Pa.

In the absence of the president and first vice-president, the second vice-president, Dr. Henry Skinner, presided. He opened the meeting with words of welcome to the foreign and other guests, who were present, many as delegates to the Seventh International Congress of Zoology. Like all new movements, this society had opposition in its inception, and there were those who did not see any necessity for its

existence. Only by trying it can we fairly tell the results. If there were not a demand for such an organization, few would enroll so promptly, but we already have over four hundred members. In the opinion of the speaker there are a few essential things which such a society should do; for one, to keep amateurs in touch with a central body. Now, this very object would be thwarted, were the society to consist, as some have advocated, of delegates from local societies, because by far the majority of entomologists are not in territory covered by any local society and would be unrepresented. In fact, the societies are so few and gathered into such small territory as to be by no means representative. Another great object of such a society is to build up and foster local societies in unoccupied territory. Every one is familiar with the growth of entomology in the present day. Many of us know the struggles of the older entomologists, and the discredit formerly cast upon their study. As an example of the present-day ever-growing interest, the NEWS might be mentioned (if reference to a personal subject may be pardoned,) which every year has had to be printed in increasing numbers, and already the edition for 1907 is exhausted. The society was only a natural incident to this increasing growth of entomology, and the speaker is a firm believer in its utility and wishes it a long life and great prosperity.

The Secretary then announced that the following persons had been duly elected Honorary Fellows of the Entomological Society of America:

Ezra Townsend Cresson
Philip Reese Uhler
William Henry Edwards
Samuel Hubbard Scudder
Henry Ulke
Henry Christopher McCook
William Harris Ashmead

The Secretary further announced that the following sixteen persons had been duly elected to fellowship in the Entomological Society of America:

John Merton Aldrich
William Beutenmuller
Philip Powell Calvert
Daniel William Coquillet
Harrison Gray Dyar
Charles Henry Fernald
Stephen Alfred Forbes
Samuel Henshaw

Andrew Delmar Hopkins	Eugene Amandus Schwarz
Leland Ossian Howard	James George Needham
Vernon Lyman Kellogg	Henry H. Lyman
William Saunders	James H. Emerton

Prof. Osborn stated that it was the sense of the Executive Committee by its Committee on Publication, that no attempt should be made at the publication of a journal that would occupy the field of any existing serials, and that it does not appear feasible to adopt any of the existing journals as the organ of the society. It seemed to be the sense of the Committee that a dignified publication might be undertaken in the nature of a series of Annals or Memoirs, but that this should not be done until there was no question as to the permanency of the form in which it be started.

On invitation of the President, Dr. Horvath, Dr. Heymons and Prof. Severin, and later, on the invitation of Dr. Holland, Prof. Kusnezov, responded each in turn with a brief address of greeting to the Society.

The Chair remarked that this was sacred entomological ground, hallowed by the work of Drs. Harris and Scudder. Dr. Scudder's very old friend, Dr. W. J. Holland, had been asked to bear him the greetings of the Society, and they now awaited with interest his response from Dr. Holland.

"No more grateful task, Mr. President," said Dr. Holland, "could have been imposed upon me than to carry to Dr. Scudder the salutations of the Entomological Society of America. This afternoon I made my way to Cambridge, afraid that I might not be permitted to see him, because of the tidings that reached me of his greatly failing health, standing almost as he was within the eternal shadows. What was my satisfaction to be met at the door by his sister, who said he would be very glad indeed to see me. There I found him perfectly helpless in body, but perfectly clear in mind. When I told him that I carried to him not only my own greetings, but those of the delegates to the Zoological Congress and the Entomological Society of America, he replied, 'This is delicious.' He asked me to thank the Society from the fulness of his heart for having remembered an old man, now almost a shadow of his former self."

Dr. Bethune expressed the thanks of the Society to their entertainers in Boston, and especially the Cambridge Entomological Club.

Dr. Smith offered a resolution, which was heartily concurred in, that the thanks of this Society be expressed to Mr. Kirkland for the wonderful opportunity afforded them for observing the experiments being carried on against the gypsy and browntail moths, etc., at Saugus.

There being no further business, the reading of papers was entered upon. Papers were read as follows:

Dr. J. B. Smith, "Some Unrecognized Sexual Characters of Noctuidæ," illustrated by lantern slides. The males of many Noctuidæ have characteristic tufts and hair pencils on the legs, and these reach their extreme development in the Deltoid series. Many other Noctuidæ have hair pencils, brushes and scale-tufts concealed on the abdomen, and of these little or nothing has been known heretofore. A few of the principal forms were shown on the slides.

J. Chester Bradley, "A Case of Gregarious Sleeping Habits Among Aculeate Hymenoptera." In the San Joaquin Valley, this summer, wasps had been noticed sleeping in bunches. Eight species were represented in considerable numbers, each species always grouped separately.

F. M. Webster, "Parasitism of Toxoptera." Illustrated by drawings to show the various position assumed by the larva of Lysiphlebus in parasitizing Toxoptera, and causing the latter to assume characteristic rotund form of parasitized individuals.

Discussion by Smith and Horvath.

J. Chester Bradley, "The Evolution of the Wings of Evaniidæ." Illustrated by charts. The wings of the Evaniidæ portray in a remarkable manner the progress of evolution. From a relatively complex venation we find gradual steps thus various degrees of atrophy resulting finally in the almost complete loss of venation. The group probably bi-phylletic.

Discussion by Holland and Kellogg.

W. L. Devereaux, "Slight Climate and Cicindela Faunal

Change and Extinction." In the absence of the author read by title only.

C. Abbott Davis, "Modern Methods of Mounting Insects." In the absence of the author read by title.

The meeting then adjourned to a smoker, at which the Society and its visitors were the guests of the Cambridge Entomological Club, and had a most enjoyable time.

J. C. BRADLEY, *Secretary-Treasurer.*

The April meeting of the Newark Entomological Society was held on the 14th of the month, Mr. Dickerson presiding and fifteen members present; Mr. William Erhardt, of New ark, a visitor. Mr. Rockwell spoke of using distilled water to spray the leaves of the plants, upon which he fed his caterpillars. He noted that many of the larvæ would sip the drops of water eagerly, and none died of disease so commonly noticed when breeding Lepidoptera. The inference to be drawn from this is that the bacteria and mineral matter being extracted, the water was rendered more nearly like that which the larvæ received in nature. Prof. Wormsbacher showed specimens of *Packardia elegans* and told of finding many of its larvæ on *Viburnum*. Mr. Zaiser exhibited a specimen of *Eutelia pulcherrima* that he had taken at light in Westchester County, N. Y.; also *Marasmalus ventilator,* bred from poison ivy. Of this latter species Prof. Wormsbacher remarked that it feeds on elm and the adult emerges in July. Mr. Dickerson showed a cocoon of the new Massachusetts pest, *Cnidocampa flavescens,* and spoke of its resemblance to leaf buds. Mr. Wormsbacher stated that he had seen hundreds of adult *Memythrus dollii* clustered on the branches of young poplar trees in Homestead, N. J., at the end of May and first of June.

Mr. Broadwell reported the capture of *Gymnandrosana punctidiscanum,* Forest Hill, Sept. 12; *Eucosma sombreana,* Newark, Aug. 27; *Eucosma suffusana,* Newark, June 8; *Elophila fulicalis,* Boonton, Aug. 13 and *Pyrausta orphisalis,* Atco, Sept. 8—all in New Jersey.

J. A. GROSSBECK, *Secretary.*

EXCHANGES.

Not Exceeding Three Lines Free to Subscribers.

☞ These notices are continued as long as our limited space will allow; the new ones are added at the end of the column, and only when necessary those at the top (being longest in) are discontinued.

Wanted.—Micro-lepidoptera, especially *Tineina*. Will give Macros or determined micros., in return. Correspondence solicited.—W. G. Dietz, M.D., 21 N. Vine St., Hazleton, Pa.

I expect to have fertile ovae of *Hypercheria budleyi*, *H. io*, *A. luna*, *T. polyphemus*, *Sphinx chersis* and others for which I would like to exchange for other fertile ovae. Would prefer ovae of genus *Apantesis* or *C. regalis*.—Alfred C. Sampson, Sharon, Mass.

Wanted.—Fertile ovae of the red variety of *T. polyphemus* for experimental purposes, together with the parent moth. Cash or exchange.—H. H. Newcomb, 43 Tremont St., Boston, Mass.

Extensive Series always of Hymenoptera, Hemiptera, Orthoptera, Diptera, Staphylinidae and Rhyncophora and from interesting regions, to exchange for material in the same groups from any part of the world.—C. F. Baker, Estacion Agronomica, Santiago de las Vegas, Cuba.

Exchange fertile ova for same.—I expect to have *luna*, *io*, *regalis*, *angulifera*, possibly *budleyi* and *modesta*; I want *gordius*, *luscitiosa*, *cerysii*, *abbottii*, *nessus*, *versicolor*, *bicolor*.—James L. Mitchell, No. 212 Indiana Trust Building, Indianapolis, Indiana.

Wanted.—American Lepidoptera and Coleoptera, also pupae and cocoons in exchange for European specimens with data and indentified. P. Albrecht, Berlin, O. 34, Kochhannstr. 38, Germany.

I should like to examine specimens of the Lampyrid tribe Phengodini, more especially the females and larvae. Will return specimens identified or arrange satisfactory exchange.—Herbert S. Barber, U. S. Nat. Mus., Wash., D. C.

Would like to exchange this summer the larvae or chrysalides of *Papilio ajax* for eggs, larvae and chrysalides of *Papilio cresphontes*, *thoas*, *philenor*, *palamedes*. Shall also have larvae of *Thyridopteryx ephemeraeformis* to exchange.—E. R. Miller, 9112 Miles Avenue, Cleveland, Ohio.

Will contract to collect any Order or Group of insects this season for private collections, museums, colleges or any public institutions. Duplicates for sale of all Orders from Colorado, New Mexico and Arizona.—Ernest J. Oslar, Alcott P. O., Denver, Colo.

Wanted.—A good collection of postage stamps issued before 1900. Offer for same, a fine long series of dinurnal Lepidoptera, first-class specimens.—Levi P. Mengel, Boy's High School, Reading, Pa.

Exchange or Purchase.—Wanted potato beetles (Chrysomelidæ) in large numbers from different States of North America, also large showy tropical beetles and brilliant Morphos.—Adolph Mares, 1206 So. Homan Ave., Chicago, Ill.

Orthoptera.—Coll., exch.—G. M. Bentley, Knoxville, Tennessee, care University of Tenn.

Wanted *Pachybrachys*.—I am trying to unsnarl the species of this genus and need much larger series than I now have. I will buy specimens from any part of North America.—Fred. C. Bowditch, 164 Rawson Road, Norfolk Co., Brookline, Mass.

Wanted for cash or exchange.—Large and showy North American insects of *all orders*, beneficial and noxious insects, specimens illustrating life histories.—Write to Dept. Natural Science, The Kny-Scheerer Co., 225-233 Fourth Ave., New York.